Punjab Technical University Jalandhar

Syllabus Scheme
(1ˢᵗ to 6ᵗʰ Semester)
For

Bachelor of Science in Hardware & Networking Technologies

Applicable from September 2010 & Onwards

STUDY SCHEME FOR
BACHELOR OF SCIENCE IN HARDWARE & NETWORKING TECHNOLOGIES

SEMESTER-I

CODE	SUBJECT	L	P	TOTAL	MARKS INT.	Marks EXT.	TOTAL MARKS
BScHNT-101	Fundamentals of Information Technology & Operating Systems	30	30	60	25	75	100
BScHNT-102	Basics of Electronics & Microprocessor	28	14	42	25	75	100
BScHNT-103	PC Assembling & Troubleshooting	30	38	68	25	75	100
BScHNT-104	Programming in C	20	20	40	25	75	100
BScHNT-105	Communication & Soft Skills	30	0	30	50	0	50
BScHNT-106	Hardware Lab-I (PC Assembling & Troubleshooting)	-	-	-	25	75	100
	TOTAL	138	102	240	175	375	550

SEMESTER-II

CODE	SUBJECT	L	P	TOTAL	MARKS INT.	Marks EXT.	TOTAL MARKS
BScHNT-201	Computer Networks	36	0	36	25	75	100
BScHNT-202	Windows 2003 Server Administration	42	42	84	25	75	100
BScHNT-203	Linux Administration	36	36	72	25	75	100
BScHNT-204	Database Administration	24	24	48	25	75	100
BScHNT-205	Software Lab- 1 (Windows 2003 Server & Linux)	-	-	-	25	*75*	*100*
	TOTAL	138	102	240	125	*375*	*500*

SEMESTER III

Sr	Paper code	Paper name	Contact Hours(Per Semester) Theory Hrs	Practical Hrs	Total Hrs	Theory Exam Mark Internal	External	Total	Practical Exam Marks Int.	Ext.	Total	Duration of Exam
1	BScHNT-301	Discrete Mathematics	38	0	38	25	75	100				3 Hrs
2	BScHNT-302	Computer Organization	30	0	30	25	75	100				3 Hrs
3	BScHNT-303	IT Applications in Business	40	70	110	25	75	100				3 Hrs
4	BScHNT-304	Digital Communications	30	32	62	25	75	100				3 Hrs
5	BScHNT-305	Software Lab-I (IT Applications in Business)	-	-					25	75	100	3 Hrs
		Total	138	102	240			400			100	

SEMESTER IV

Sr	Semester Paper code	Four Paper name	Contact Hours(Per Semester)			Theory Exam Mark			Practical Exam Marks			Duration of Exam
			Theory Hrs	Practical Hrs	Total Hrs	Internal	External	Total	Int.	Ext.	Total	
1	BScHNT-401	Network Routing Technologies	38		38	25	75	100				3 Hrs
2	BScHNT-402	Router Configuration & Security	40	40	80	25	75	100				3 Hrs
3	BScHNT-403	Network Switching Technologies	30	32	62	25	75	100				3 Hrs
4	BScHNT-404	WAN Technologies	30	30	60	25	75	100				3 Hrs
5	BScHNT-405	Hardware Lab-I (Network Routing, Switching & WAN Technologies)							25	75	100	3 Hrs
		Total	**138**	**102**	**240**			**400**			**100**	

SEMESTER V

Sr	Semester Paper code	Five Paper name	Contact Hours(Per Semester)			Theory Exam Mark			Practical Exam Marks			Duration of Exam
			Theory Hrs	Practical Hrs	Total Hrs	Internal	External	Total	Int.	Ext.	Total	
1	BScHNT-501	Advanced OS Concept with MS-Windows Client	28	20	48	25	75	100				3 Hrs
2	BScHNT-502	Managing and Maintaining a Microsoft Windows Server	40	32	72	25	75	100				3 Hrs
3	BScHNT-503	Microsoft Windows Network Infrastructure	40	30	70	25	75	100				3 Hrs
4	BScHNT-504	Implementing and Managing Microsoft Exchange Server	30	20	50	25	75	100				3 Hrs
5	BScHNT-505	Software Lab-I (Microsoft Client & Server)							25	75	100	3 Hrs
		Total	**138**	**102**	**240**			**400**			**100**	

SEMESTER VI

Sr	Semester	Six	Contact Hours(Per Semester)			Theory Exam Mark			Practical Exam Marks			Duration of Exam
	Paper code	Paper name	Theory Hrs	Practical Hrs	Total Hrs	Internal	External	Total	Internal	External	Total	
1	BScHNT-601	Linux Server Management	40	40	80	25	75	100				3 Hrs
2	BScHNT-602	Wireless Networking	40	40	80	25	75	100				3 Hrs
3	BScHNT-603	Security Essentials	28	10	38	25	75	100				3 Hrs
4	BScHNT-604	Project (PC Assembling)							25	75	100	3 Hrs
5	BScHNT-605	Hardware Lab-I (Linux Server Management & Security Essentials)							25	75	100	3 Hrs
		Total	**138**	**102**	**240**			**300**			**200**	

Guidelines for Internal Assessment:
The internal marks will be based on a continuous assessment and the following is to be adhered to :
- Test/Quiz's (15 Marks). Best 2 out of 3.
- Presentation/Reports/Home assignments (5 Marks)
- Class attendance/General behaviour (5 marks)

Guidelines for External Practical / Viva-Voce:
The external practical /viva-voce will be conducted as per the details mentioned above in study scheme by an external examiner appointed by the University.

<p align="center">Semester-I</p>

BScHNT-101   FUNDAMENTALS OF INFORMATION TECHNOLOGY & OPERATING SYSTEMS

INSTRUCTIONS FOR PAPER-SETTER
The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.
The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.
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Section I

Introduction
What is computer? Characteristics of Computers. How Computers evolved. Some earlier computers like Mark-I, EDVAC, EDVAC, EDSAC, UNIVAC. The five computer generations-key technologies, features and characteristics of each generation.

Basic Computer Organisation
Five basic operations of a computer. Block diagram showing basic organization of a computer system. Input Unit, Output Unit. Storage Unit: Primary storage, Secondary Storage. Arithmetic Logic Unit. Control Unit. Central Processing Unit. The System Concept. The Main Memory. Main Memory Organisation. Main Memory Capacity. RAM, ROM, PROM, EPROM, UVEPROM, EEPROM. Cache Memory.

Number Systems
Non-Positional Number Systems, Positional Number Systems: Binary, Octal, Hexadecimal number system, Converting from one number system to another.

Computer Arithmetic

Why binary numbers instead of decimal numbers. 7-bit ASCII Code. Binary arithmetic: Addition, Subtraction.

Section II

Secondary Storage Devices

Secondary Storage Devices: Limitations of primary storage, Sequential and Direct-Access Devices. Magnetic Disk, Basic principle of operation, Storage Organisation, Storage Capacity, Access mechanism, Access Time: Seek Time, Latency, Transfer Rate. Disk Formatting, Disk Drive, Disk Controller, Types of Magnetic Disks, Floppy Disks, Floppy-disk Drive, 3½-inch Floppy Disk, Hard Disks: Zip Disks, Disk Packs, Winchester Disk, Advantages and Limitations of Magnetic Disks, Uses of Magnetic Disks. Optical Disk, Basic principle of operation, Storage organization, Storage capacity,

Access Mechanism, Access Time, Optical Disk Drive, Types of Optical Disks: CD-ROM, WORM Disk, Advantages and Limitations of Optical Disks, Uses of Optical Disks

Input Devices

Keyboard. Point and Draw Devices: Mouse, Trackball, Joystick, Electronic pen, Touch Screen. Data Scanning Devices: Image Scanner: Flat-Bed and Hand-held Scanner, Optical Character Recognition Device, Optical mark reader, Bar-Code Reader, Magnetic-Ink Character Recognition. Digitizer. Electronic-card Reader. Voice Recognition Devices. Vision-Input System

Output Devices

Monitors Printers: Dot-Matrix Printers, Inkjet Printers, Laser Printers. Screen Image Projector. Voice Response Systems: Voice Reproduction System, Speech Synthesizer

Computer Software

What is Software? Relationship between Hardware and Software, Types of Software: System Software, Application Software, Functions of System Software, Type of System Software: Operating Systems, Language Translators, Utility Programs, Communications Software. Application Software, Commonly Used Application Softwares: Word Processing, Spreadsheet, Database, Graphics Personal Assistance, Education, Entertainment Software. Logical System Architecture showing relationship between hardware, system software, application software and users of a computer system. Firmware

Computer Languages

Analogy with natural languages, Machine Language, Advantages and Limitations of Machine Language, Assembly language: Assembler. Advantages of Assembly Language over Machine Language. Limitation of Assembly Language, High-Level Language: Compiler. Linker, Interpreter. Advantages and Limitations of High Level Languages, Some High Level Languages: Basic, Pascal, C, C++, Java.

Section III

Operating Systems

What is an Operating System? Main Functions of an Operating System. Measuring System Performance: Throughput, Turnaround time, Response time. Process Management: Process management in early systems. Multiprogramming: Requirements. Multitasking. Multiprocessing:

Advantages and limitations. Difference between Multiprogramming and Multiprocessing. Timesharing: Requirements, Advantages. Memory management: Uniprogramming,

Multiprogramming with fixed and variable number of memory partitions. Virtual memory: How is virtual memory realized? , Advantages and disadvantages of virtual memory. File management: File access methods-Sequential and Random access files, File operations, File naming. Command Interpretation: Command line interface, Graphical user interface. Some popular operating systems: Unix, MS-DOS, Microsoft Windows, Linux

The Internet
What is Internet? Brief History. Electronic mail. File Transfer Protocol. World Wide Web. WWW Browsers. Uses of the Internet

Classification of Computers
Notebook computers, Personal Computers, Workstations, Mainframe Systems, Supercomputers, Clients and servers.

BScHNT-102   BASICS OF ELECTRONICS & MICROPROCESSOR

Section I   Analog Electronics

Basic Concepts of Electricity
Work and Energy, Matter and Electrons, Conductors, Insulators, Semiconductors, Electrical potential difference.

Electrical Terms
Voltage, Current, Resistance, Power, Efficiency, Ohm's law

The Electric Circuit and Voltage Generation
The need for a complete path, Basic circuit elements: Source, Control element, Switches, Relays, Load. Voltage rises and Voltage drops. The concept of ground. Circuit Problems : shorts, opens.

Resistors
Fixed resistors: Carbon composition resistors, Wirewound resistors, Resistor color code, Film type resistors. Variable resistors

Series Circuits
Two resistor circuit: Finding current values, Finding voltage drop values.

Parallel Circuits
Two resistor circuit: Finding current value in each branch.

Inductors and Capacitors
Inductors, Inductance, Capacitors, Capacitance, Capacitor ratings.

Alternating Current Terms
Amplitude, Period, Frequency, Wavelength, AC Waveforms.

Transformers

Principle, Turns ratio, Types of Transformers: Low frequency, Intermediate and Radio frequency transformers. Voltage step up and step down.

Semiconductors Materials and Rectifiers
Properties of Semiconductors, Commonly used semiconductors, Intrinsic Semiconductor, Extrinsic Semiconductor, PN Junction, Diode, Rectifiers (Half Wave, Full Wave, Bridge).

Tubes, Transistors and Integrated Circuits
Vacuum tubes, Vacuum tube diode, Amplification. Transistor: NPN and PNP schematic symbols. Transistor switches. Introduction to Integrated circuits.

Section II   **Digital Electronics**

Boolean Algebra and Digital Circuits
Fundamental concepts of Boolean Algebra, Logic gates, Converting Boolean expression to Logic circuits.

Multiplexer and Demultiplexer
Digital Multiplexers/Data Selectors (4 to 1), Digital Demultiplexers (1 to 4).

Flip Flop Devices
Bistable device, What is a Flip-Flop, Working of RS Flip Flop, D Flip-Flop, J-K Flip-Flop.

Registers and Counters
Principle of Shift Registers, Working principle of Counters.

Section III Introduction to Microprocessors
Concept of bus: address bus, data bus, control bus, Block diagram showing the architecture of 8085 Microprocessor, Brief introduction of different units, Basic instructions (MOV, LDA, STA, ADD, SUB, INR), Introduction to assembly language using these basic instructions: Loading data, Moving data, Addition of two numbers.

BScHNT-103   PC ASSEMBLY & TROUBLESHOOTING

Section I

Components of a PC
Identifying the major components of a PC: System unit, Monitor, Keyboard, Mouse devices, Handling PC connections. Identifying the internal components of a PC: Opening a system unit, Handling expansion cards.

CPU
Identifying the right CPU for any motherboard : CPU manufacturers, Processor models, CPU speeds, Processor packages Installing and Upgrading CPUs. Heat Sink and Fan assembly.

RAM
What does RAM do, Types of RAM Technologies: SDRAM, DDRSDRAM, RDRAM, RAM Packages: SIMMS, DIMMS and RIMMS. Adding and Upgrading RAM.

Motherboard and BIOS
Common motherboard features, Types of Motherboards: AT, ATX, microATX, Proprietary Motherboards. Installing a motherboard. The System BIOS: Why do we need BIOS

Expansion Bus
Expansion Buses, Internal Buses: ISA, PCI, AGP, Installing a Plug and play Expansion Card, External Expansion Buses: USB.

Power Supplies and Cases
Case Form Factors: AT, ATX, miroATX, Power Supply: Wattage, Connectors. Cooling: Power supply Fan, Caser Fans.

Section II

Removable Media
Identifying, Installing and Troubleshooting Floppy Drives: How floppy drives work, Floppy Drive Cables, Installing a Floppy Drive, Bootable Floppy Disks.

Hard Drives
How hard drives store data: Partitions and File Systems. Installing a Hard Drive, Configuring a Hard Drive: Partitioning, Formatting. Hard Drive Maintenance and Troubleshooting: ScanDisk, Defragmentation, Disk Cleanup.

CD Media
Understanding CD Media Technologies: CD data storage, CD-ROM, Speeds, CD-R, CD-RW, DVD, Installing CD Media Drives, Using CD Media: Autoplay in Windows XP, Burning CDs. CD Media Troubleshooting: Drive problems, Disc problems..

Section III

Video
Selecting the right Monitor. CRTs: How CRTs work. LCDs: How LCDs work. Selecting the right video card: Graphics processor, Video RAM. Installing and configuring video software. Troubleshooting Monitor Problems: Fuzziness, Missing color, missing pixels, Dim screen, No image. Video Card Problems.

Input Devices
Installing a Keyboard, Connections: DIN, USB, Wireless. Mouse: Standard, Optical, Mouse connections.

Sound
How sound works in a PC, MIDI, Purchasing the right sound card: Processor capabilities, Speaker support, Recording quality. Installing a sound card in a Windows System, Troubleshooting Sound.

Printers
Identifying Current printer Technologies: Dot matrix, Inkjet, Laser. Installing a Printer on Windows PC, Performing basic Printer maintenance, Recognizing and fixing basic printing problems

BScHNT-104   PROGRAMMING IN C

Section I

Structure of C Programming
Structure of a C Program, Execution of a C Program

Basic Elements
Character set, Identifiers and Keywords, Data Types, Constants, Variables, Declaration of Variables, Expressions, Statements, Overflow and underflow, Reading data from keyboard, Symbolic constants.

Operators and Expressions
Arithmetic operators, Integer arithmetic, Real arithmetic, Mixed mode arithmetic, Relational Operators, logical Operator, Assignment Operators, Increment and Decrement Operators, Conditional Operator. Arithmetic Expressions and their evaluation

Section II

Input and Output Operations
Reading a character, Writing a character, Formatted input and Output

Control Statements
if statement, switch statement, goto statement, while statement, do-while statement, for statement. Jumping in/out of a loop, Skipping part of a loop.

Arrays
One dimensional array, Two dimensional array, Multidimensional array.

Section III

Character Strings
Reading and Writing Strings, Arithmetic operators on Characters, Putting Strings together, Comparison of Two Strings, Functions for String handling: strcat, strcmp, strcpy, strlen

User Defined Functions
Advantages of User defined functions, Defining a function, Category of functions, Function Prototypes, Recursion, Function with arrays, Nested functions, variables in functions

BScHNT-201   COMPUTER NETWORKS

Section I

Basic Concepts
Components of Data Communication, Distributed processing, Standards and Organisations, Line Configuration, Topology and Types of Topology, Transmission Mode, Categories of Networks.

OSI and TCP/IP Models
What is Protocol, OSI Model, Layers and their functions. Transport Protocol: Introduction to TCP/IP, Internet Protocol. Protocols forming part of IP, Internet Upper-Layer Protocols: FTP, TELENT. Comparison of different models (TCP/IP vs. OSI Model)

Section II

Digital Transmission Interfaces and Modems
Types of Data: Digital Data, Analog Data., Data Transmission: Difference between digital data and analog data transmission, Digital to Analog conversion, Interfaces and Modems: DTC-DCE Interface. Modem: Analog Modem, Digital Modem, Asynchronous Modems, Cable Modem.

Transmission Media
Noise absorption, Radiation, Attenuation, Bandwidth. Guided and Unguided media. Comparison of media

Introduction to Signals
Analog and Digital Signals, Periodic and Aperiodic Signals, Time and Frequency domains. Composite signals.

Section III

LANS and MANS
Local area network: Advantages, disadvantage, characteristics. Metropolitan area network. IEEE 802, Ethernet : Physical layer, Physical layer interface, Data link layer, system configurations, 10Base-5, 10Base-2, 10Base-T, Physical network topology used for Ethernet. Token passing Networks. Fiber distributed data interface for MANs. Switched multimegabit data services.

Switching
What is switched network? Circuit Switching, Packet switching, Message switching

Point to Point Protocols
What is remote access? RAS, Transmission states, Point to Point layers, Link control protocol, Authentication, Network control protocol.

BScHNT-202   WINDOWS 2003 SERVER ADMINISTRATION

Section I

Overview of MS Windows Server 2003 System Administration
Microsoft windows server 2003, Domain controllers and members servers, Understanding and using server roles, frequently used tools, Using control panel utilities, Using graphical administrative tools, Using command line utilities.

Managing Servers Running Windows Server 2003
Managing networked systems, connecting to other computers, sending console messages, using computer management system and storage tools, Working with services and applications, Managing System environments, profiles and properties, Managing hardware devices and drivers.

Section II

Monitoring Processes, Services and Events
Managing applications, processes and performance, Task manager, Administering applications and processes, Viewing and managing system performance and networking performance, Managing system services, Event logging and viewing, Monitoring server performance and activity, Why monitor your Server?, Getting ready to monitor, Using performance logs ,Viewing and replaying performance logs, Configuration alert for performance counters, Running scripts as actions, Tuning system performance, Monitor and tuning memory usage, processor usage, disk I/O.

Understanding User and Group accounts
The windows server 2003 security model, Differences between user and group accounts, Default user accounts and groups, Account capabilities, Using default group accounts.

Creating User and Group accounts
User account setup and organization, Configuring account policies, Configuring user rights policies, Adding a user account, Adding a group account, handling global group membership.

Section III

Working with Support Services and Remote Desktop
Introducing support services, Working with the automated help system, using the help and support center, introducing the application frame work, monitoring system health. Understanding and using automatic updates, an overview of automatic updates, configuring automatic updates, and update servers, downloading and installing automatic updates ,removing automatic updates to recover from problems, Managing remote access to servers, Configuring remote assistance and remote desktop access, Making remote desktop connections, Configuring windows time and window server 2003, enabling and disabling window time on stand – alone and member servers.

BScHNT-203   LINUX ADMINISTRATION

Section I

Installing Red Hat Linux
Starting the Red Hat Linux installer, Beginning the installation, Installation type, Disk partitioning setup, Disk setup, Boot loader configuration, Account configuration, Installing packages, Graphical interface configuration, Finishing first run configuration.

Navigating Linux at the Console
Understanding virtual consoles, Logging in a virtual console, Introducing the shell, Working with the filesystem, Linux file system, Home directory, Current working directory, manipulating files and directories, Understanding permissions.

Making the console work for you
Creating, Editing and Saving text files using vi, Using emacs to create text files, Grouping files for efficient file management, Searching files and directories quickly, Using pipes, Moving between multiple open applications.

Section II

Introducing the Red Hat Desktop
GNOME and KDE Environment, Logging in to desktop, Launching applications, Using window controls, working with multiple windows, Understanding virtual desktops.

Working with files on the desktop
Opening, editing and closing an existing file, Cutting, copying and pasting files, Duplicating a file, Renaming, Deleting items, Changing file permissions, Creating a new directory, Manipulating files using drag and drop, Working with trash contents.

Section III

Command Line System Administration
Using the su command, Managing system processes, Managing running services, Managing filesystems, Managing accounts.

Desktop System Administration
Managing system processes, Managing running services, Managing network interfaces, Managing accounts, Reading system logs, Mounting and unmounting filesystems

BScHNT-204   DATABASE ADMINISTRATION

Section I

Intro to Database and SQL Server 2000: Client/Server Concept, Types of Databases, Relational Vs. Flat File Database. Background of SQL Server, Versions of SQL Server and Clients Supported by SQL Server. Installation & Configuring SQL Server: Installing SQL Server 2000, Unattended Installations, SQL Server Services. Configuring SQL Server Network Protocol Settings. Installing SQL Server Clients.

SQL Server Tools and Utilities: Managing SQL Server with Enterprise Manager, Query Analyser, SQL Server Groups. Tools Menu, Action Menu. Introduction to Transact – SQL(T-SQL)

Section II

Managing Database: Creating Database, Database File Placement(RAID 0, RAID 1 RAID 5), Creating Database using T-SQL and Enterprise Manager. Altering, Renaming, Dropping Database. Creating Objects in Database: Tables, Views, Constraints, Indexes.

Managing Security: Understanding Security Modes, Windows Authentication Modes, Mixed Mode, SQL Server Logins, Windows Logins, Fixed Server Logins, Creating Users, Database Roles, (Grant, Revoke, Deny) N-Tier Security.

Section III

Database Backups and Restore: Copying Database with Copy Database Wizard. SQL Database Backup Modes(Full, Differential, Transactional Log Backup). Backing Up of the Database. Restoring Database. DTS: Its meaning, DTS Packages. DTS Storage and Designer.

SQL Server Agent: Configuring Understanding Alerts, Jobs and Events. Creating Jobs: Multi Server Jobs, Creating, Editing and Deleting of Jobs. Optimization Techniques: Queries and Stored Procedure, Proper Indexing, Locks and Defragmentation.

Semester-III

BScHNT-301   DISCRETE MATHEMATICS

Section I

Set Theory
Introduction, Definition and Concepts, Representation of Sets, Finite Sets, Infinite Sets (Definition)
Set Operations: Union, Intersection, Addition theorem, difference, Symmetric Difference
D' Morgan's Law, Subsets, Power Sets, Partitions Sets, Mathematical inductions, Computing Principles, Permutations, Combinations.

Boolean Algebra
Introduction, Basic Definitions, Duality, Basic Theorems, Boolean algebra And lattice, Representation Theorem, Sum-of-product form for sets, Sum-of-products form for Boolean algebra

Section II

Functions
Introduction: Definitions and Concepts, One to One, onto functions, Invertible functions, Mathematical Functions: Floor and ceiling functions, Integer and Absolute value functions, Remainder functions, Exponential functions, logarithmic functions
Sequences and Series: Definitions, Different between sequences and series, To find nth term and sum of n terms.
Recursive functions: Definition and Examples

Section III

Permutation, Combinations and Matrices

Permutation, Combinations, Metrics -Definition and Concept, Square matrix, unit matrix, null matrix, Matrix Addition, Multiplication, Scalar multiplication, Transpose of a Matrix, Invertible matrices, Inverse of a matrix.
Determinants, Basic theorems of determinants, Boolean Matrix

BScHNT-302   Computer Organization

Section I

Register Transfer and Micro operation
Register transfer, Register transfer language, Bus and memory transfer, Arithmetic micro operations, Logic micro operations, Shift micro operations.

Basic Computer Organization and Design
Instruction codes, Computer registers, Computer instructions, Timing & control, Instruction cycle – in Details, Various Memory reference instructions, Input- output and various types of interrupts, Design of a basic computer, Design of accumulator logic.

Section II

Micro-programmed Control Unit
Control memory, Address sequencing.

Central Processing Unit
Introduction, General registers organization, Stack organization, and Instruction formats, Addressing modes. Direct, Indirect, Immediate.

Computer Arithmetic
Introduction, addition and subtraction, multiplication algorithms, division algorithms, floating point arithmetic operation, decimal arithmetic unit, decimal arithmetic operations.

Section III

Input – Output Organization
Peripheral devices, input – Output interface, Asynchronous data transfer, Modes of data transfer, Priority interrupt, direct memory access, input – output processor.

Memory Organization
Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware.

Section I

Introduction to a typical Word Processor

Introduction to Office 2000, Introduction to Word 2000, Features of Word 2000, Screen Components of Word 2000: Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, Rulers, Scroll Bars, Working area.

Creating, Saving, Opening a Word document and Page Setup.

Page Views: Normal View, Web Layout View, Print Layout View, Print Preview, Outline View. Changing Measurement unit. Formatting a document: Character formatting, Font- Character Spacing & Animated text. Text Alignment.

Paragraph formatting: Alignment, Bullets and Numbering, Drop Capital.

File Saving, File Extension. Border & Shading, Theme, Style,

Paragraph Formatting: Indents & Spacing, Various type Tab Setting, Change Case, Style, Newspaper Columns, and Track Changes.

Reusability features: AutoText, Spike, AutoCorrect, Comment, Template

Enhancing a document appearance: Headers and Footers, Footnotes, Comment, Inserting Picture, Bookmark

Spelling and Grammar checking, Auto Summarize, Table Creation and manipulation of data including calculation, Table Auto formatting, Table Sorting, MS-DRAW including Word Art, Text Box, Mail Merge, Macro, Object Linking and Embedding (OLE)

Section II

Introduction to a typical Spreadsheet Application

Introduction to Excel 2000, Features of Excel 2000, Excel Screen components: Title bar, Standard Toolbar, Formatting Toolbar, Formula Bar, Status Bar, Worksheet Frame, Column heading and Row heading.

Cell, Cell Addressing, Worksheet Icon, Navigating the Worksheet, Entering and editing data, Simple Formula, Rearranging the data, Cut, Copy, Paste, Auto fill, Transpose

Working with Worksheet: Naming a sheet, Inserting, Deleting, Copying, Moving sheet(s)

Inserting, Deleting, Hiding, Un-hiding Rows/Columns

Saving and Closing Workbook, Workspace.

Splitting windows and Fixing Titles (Freeze). Formatting Cells: Numbers, Alignment and Orientation, Font, Border, Pattern, Auto Formatting, Style, Conditional Formatting, Comment, Formula using Function (s): Sum, Avg, Max, Min, Int, Round, Count, If-else

Cell References: Relative reference,   Absolute reference, mixed mode reference

Operators: +, -, *, /. Recalculating Formula, Create Name and Define Name.

Chart: Creating a Chart, Chart types, Manipulate Data Series, Enhancing a Chart, Design Chart with Object/Picture.

Data Query: Auto Filter, Advanced Filter

Utility tool: Subtotal, Validation.

What-If Analysis: Goal Seek,   Solver and Scenario.

Pivot Table & Pivot Chart

Data Form, Macro, Object Linking and Embedding (OLE)

Section III

Introduction to typical Presentation Software
Introduction to PowerPoint 2000, Features of PowerPoint, Create a presentation
Different types of Slide view: Slide, Outline, Slide Sorter, Note Page
Formatting the slide: Font, Alignment, Slide Layout, Slide Color Scheme, Headers and Footers, Design Slide, Text Box, Picture, Chart, Object, Comment, Auto Shapes, Action Button, Slide Transition, Custom Animation, Preset Animation, Spell Checking and AutoCorrect, Macro.

Introduction to Internet
What is Networking?, Internet Addressing and Domain Naming System (DNS)
Protocol: HTTP, FTP, WWW and Telnet.
Concept of Modem, Communication software, Internet Account, Client Program/Browser
Setting up an Internet connection, File Downloading process, E-mail, Searching & Spider Program, Concept of Search Engine & Search Directory.

BScHNT – 304   Digital Communications

Section I

Introduction : Analog and digital communication
Discrete signals. Elements of digital communication system, Source encoding: Pulse code modulation, quantization noise, linear and non-linear quantization, companding- A-law and μ-law. Differential pulse code modulation, delta modulation, adaptive delta modulation, Linear predictive coders

Section II

Baseband transmission

Baseband signal receiver: probability of error calculations, optimum filters, coherent reception, matched filter and its transfer function. Integrate and dump type filter. Regenerative repeater, Bit synchronization, Inphase and midphase synchronizer. Early late gate synchronizer. Frame synchronization.

Line coding

Polar/Unipolar/Bipolar NRZ and RZ; Manchester, differential encoding and their spectral characteristic, self synchronization properties of some of the encoded signal.

Section III

Equalization

Inter symbol interference (ISI), Purpose of equalization, Eye pattern, Nyquist criterion for zero ISI, fixed equalizer, Design of equalizer, Adaptive equalizer.

Digital modulation techniques

BPSK, DPSK. BFSK, M-Ary PSK & FSK, QPSK, MSK, QASK, Error calculations

BScHNT – 401   Network Routing Technologies

Section I

Introduction
Overview of Networking, Advantage of Network, Types of network, Network Models

OSI Model
Physical Layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer

The DOD Model
The Process/Application Layer, The Host-to-host Layer, The Internet Layer, The Network Access Layer

IP Addressing – Fundamentals
The Hierarchical IP Addressing Scheme
        Class A Addressing
        Class B Addressing
        Class C Addressing
        Class D And Class E
    The Private IP Addresses

    IP Addressing & Sub Netting
        Subnet Masking With Class C
        Subnet Masking With Class B
        Subnet Masking With Class A
    Design an IP addressing scheme to support Classless and Class full
Private addressing requirement

Section II

TCP/IP Protocols
Overview of a Sample TCP/IP Network, Transmission Control Protocol (TCP), User Data gram Protocol (UDP), Address Resolution Protocol (ARP), Internet Control Message Protocol (ICMP), FTP and TFTP
TCP/IP Protocols: TCP and UDP, IP, Application Layer Protocols,   HTTP,   FTP and TFTP, SMTP, POP3, DNS, DHCP, SNMP
Different Network Protocols and their Comparisons, IPX/SPX, The IPX Header Properties, SPX and NCP, Data Link Layer Encapsulation.
NetBEUI, NetBIOS Naming, The NetBEUI Frame
AppleTalk, The AppleTalk Address, Protocols in the AppleTalk Suite
Local Area Network: Ethernet, Ethernet Cabling, The Ethernet MAC Sub Layer Protocol, Ethernet Performance, Traditional Ethernet,   MAC Sub layer, Physical Layer, Physical Layer Implementation,

Bridged Ethernet, Switched Ethernet, Full-Duplex Ethernet, Fast Ethernet, MAC Sub layer, Physical Layer, Physical Layer Implementation, Gigabit Ethernet, MAC Sub layer, Physical Layer, Physical Layer Implementation, IEEE 802.2: Logical Link Control, Retrospective on Ethernet, Fiber Optics Used in FDDI, Ethernet at Data Link Layer, Ethernet_II, IEEE 802.3, IEEE 802.2, SNAP

Ethernet at Physical Layer: Straight Through Cable, Cross Over Cable, Rolled Over Cable, and Practical of cabling.

Wireless LAN, Wireless Topology, IEEE 802.11a/ 802.11b, Wireless Security

Configuring our Wireless Internet work, WAP, Blue tooth technology, AWPP, Mesh and LWAPP

Section III

Routing
Routing Principles
        Distance Vector
        Link State
        Hybrid
    Configuring Static Routing
    Testing and troubleshooting
    Default Routing
    Dynamic Routing Protocols
    Configuring Dynamic Routing with RIP
    Routing Loops Preventing Mechanisms
        Max Hop Count
        Split Horizon
        Route Poison
        Hold Down Timer
    VLSM
    CIDR
    Route Summarization
Configuring IGRP
Configuring EIGRP

OSPF Operation
Configuring OSPF in Single Area
OSPF Operation in Multiple Areas
Configuring OSPF in Multiple Areas

Internet Protocol Version 6 (IPv6)
Why do we need IPv6?
The Benefits and uses of IPv6
IPv6 Addressing and Expressions
Address Type
Special Address
How IPv6 Works in an Internetwork
Autoconfiguration
Configuring Cisco Routers with IPv6
ICMPv6
DHCPv6
IPv6 Routing Protocols

RIPng
EIGRPv6
OSPFv6
Migrating to IPv6
Dual Stacking
6to4 Tunneling
NAT-PT
Configuring IPv6 on Our Internetwork
Configuring RIPng
Configuring OSPFv3

BScHNT – 402 Router Configuration & Security

Section I

Introduction to Cisco Devices

Different Series of Cisco Routers
Different Series of Cisco Switches
Cisco Three Layer Hierarchical Model
          The Core Layer
          The Distribution Layer
          The Access Layer
Design or modify simple LAN using Cisco Products
Demonstrate the Mathematical skills required to work seamlessly with Integer, Decimal, Binary and Hexadecimal Numbers and Simple Binary Logic

Section II

Cisco Router's Basic Components & SDM
Introduction to Cisco IOS
Cisco IOS Booting Procedure
Basic configuration of Cisco IOS
Cisco IOS Advanced configuration including Passwords and Telnet
Cisco Security Device Manager (SDM)
Installing SDM on Your Computer
Using SDM for Backup/Restore and Edit
Using SDM to Telnet into Your Router
Configuring VPN using SDM
Using the SDM to Manage the Flash Memory
Config-Register
Password Recovery

Verifying Config-Register With "Show Version" Command
Managing Cisco Internetwork
Back up, Restore and Up gradation of Cisco IOS
IP Name resolution with DNS

Section III

Understanding Access List (ACL) Security
Developing Access List to meet user requirement
Types of ACL
Configuring Standard ACL
Configuring Extended ACL
Configuring Named ACL

BScHNT-403   Network Switching Technologies

Section I

Monitoring Cisco Internetwork
Cisco Discovery Protocol (CDP)
Telnet
Describe the Enterprise Composite Model and its Performance & Scalability
Layer 1, 2 & 3 technologies used in Switched Network
Explain the role of switches in the Enterprise Composite Model

Section II

Monitoring Cisco Switched network
Function of Switching Database Management (CAM & TCAM) within Catalyst Switches
Explain Spanning Tree Protocol (STP)

Identify the specific types of Cisco Route switch processor and implementation details
Catalyst Switch 1900 configuration
Catalyst Switch 2950 configuration

Section III

Features and Operations of VLAN
Features of VTP
Describe how VTP Version 1 & 2 Operate
VTP Domains
VTP Modes
VTP Advertisements and Pruning
VLAN Configuration with 1900 Series Switch
VLAN Configuration With 2900 Series Switch
List and describe the operation of Key components required to implement Inter – VLAN
VLAN Trunking

Troubleshooting common VLAN Problems
Identify Inter VLAN Routing Performance & Scalability issues and Propose solutions

BScHNT-404   WAN Technologies

Section I

Network Address Translation
Understanding and Configuring NAT
Practice of NAT Configuration With Simulator

WAN Technologies
Synchronous Dial-in, Frame Relay, ISDN, Cable Modem, DSL, Leased Line, VSAT, PSTN, Structure and Operation of VPN, Explain the operation of Remote Access Control Method.

Section II

WAN Protocols
HDLC, PPP, SLIP, ATM, PPP Authentication and Encapsulation Method, Configuring PPP

ISDN Protocols and Design
ISDN Channels: PRI, BRI, ISDN Protocols, ISDN Function Groups and Reference Points
ISDN Components, Typical ISDN Configurations , PAP and CHAP , Multilink PPP , Dial-on-Demand Routing.

Section III

Frame Relay
Protocols, Virtual Circuits, LMI and Encapsulation Types, DLCI Addressing Details
Network Layer Concerns with Frame Relay, Frame Relay Configuration
Fully Meshed Network with One IP Subnet/IPX Network
Partially-Meshed Network with One IP Subnet/IPX Network Per VC
Partially Meshed Network with Some Fully Meshed Parts
Frame Relay Verification, Frame Relay Configuration, Frame Relay Configuration Dissection

BScHNT-501   Advanced OS Concept with MS-Windows Client

Section I

Installation Methods
Attended Installations, Automating Installations, Creating Unattended Installation Files
Upgrading and Troubleshooting

Administering Resources
Sharing Files, NTFS Permissions, Managing File Resources, Administering Printers

Configuring Hardware
Installing Hardware
Media Devices

Input and Output Devices
Other Devices

Section II

Optimizing the System
Driver Signing and Hardware Profiles, Scheduling and Offline Profiles, Optimizing Performance,
Optimizing Disks, Network, and Applications, Recovering from Disaster

Configuring the Desktop
Configuring User Profiles, Configuring and Securing the Desktop , Installing and Configuring
Applications, Fax and Internet Options

Section III

Networking the System
Networking Models, Networking Basics, Configuring TCP/IP, Troubleshooting TCP/IP
Name Resolution, Connecting to Resources, IIS and Remote Desktop

Securing the System
Managing Users, Creating User Accounts, Managing Groups, User Rights and Policies
Security Events, Security Templates and File Encryption

BScHNT-502   Managing and Maintaining Microsoft Windows Server

Section I

Advanced Features of Windows Server 2003
New Active Directory features, New file and print services features, Revised IIS architecture, New
clustering and load balancing features, New networking and communications features, New security
features, New storage management features
New terminal services features, new media services, XML web services, and The Windows 2003
Server family, Licensing Windows 2003 Server, Activating Windows 2003 Server Installing Windows
2003 Server, Upgrading to Windows 2003 Server.

Managing Physical and Logical Disks
Understanding disk terminology and concepts, Managing disks with the MMC , Managing disks with
command-line utilities, Managing basic disks, Managing dynamic disks, Understanding disk
fragmentation, Using the disk defragmenter, Understanding disk quotas, Enabling and configuring
disk quotas, Implementing RAID Solutions, Understanding remote storage, Installing and configuring
remote storage, Administering remote storage, Troubleshooting disks and volumes

Configuring, Monitoring, and Troubleshooting Server Hardware
Understanding Server Hardware, Understanding Device Drivers, Configuring Driver Signing Options,
Understanding Windows File Protection, Understanding the System File Checker, Understanding File
Signature Verification, Using the New Hardware Wizard, Using Device Manager, Device Installation
and Configuration Best Practices
Monitoring Server Hardware, Monitoring Server Hardware with Command-Line Utilities
Using the Performance Console, Hardware Monitoring Best Practices , Troubleshooting Hardware
Devices, Diagnosing and Resolving Startup Issues, Hardware troubleshooting.

Managing User, Group, and Computer Accounts

Understanding Security Objects, Understanding Management Tools, Understanding Command-Line Management Tools, Managing User Accounts, Managing User Accounts with Command-Line Utilities, Troubleshooting User Accounts, Understanding Group Accounts, Creating Group Accounts, Managing Group Accounts with Command-Line Utilities, Managing Group Accounts, Group Membership Management Best Practices

Creating and Managing Computer Accounts, Managing Computer Accounts with Command-Line Utilities, Creating a Replica Domain Controller, Creating a Domain Controller for a New Forest. Creating a Domain Controller for a New Child Domain ,

Creating a Domain Controller for a New Domain Tree, Assigning Domain Controller Operations Master Roles, Troubleshooting Computer Accounts

Section II

Managing Access to Resources

Understanding Access Control, Assigning NTFS Permissions, Denying NTFS Permissions, Using NTFS Special Permissions, Copying or Moving Files and Folders

Using Shared-Folder Permissions, Understanding the Interaction of Share Permissions and NTFS Permissions, Using Shared Folders in Active Directory, Understanding Permission Inheritance, Understanding User Rights, Using Group Policy to Set User Rights, Troubleshooting Access Problems, Managing Access with Command-Line Utilities, Understanding Disk Encryption, Understanding EFS Architecture, Encrypting Files and Folders, EFS Best Practices, Understanding Public Key Infrastructure,

Installing and Using Windows Server 2003 Certificate Services .

Configuring Terminal Services

Understanding Windows Terminal Services, Understanding Terminal Services Components, Configuring Remote Desktop for Administration , Planning Remote Desktop Security, Understanding Remote Assistance , Configuring Remote Assistance

Configuring Windows Messenger, Planning Remote Assistance Security , Installing and Configuring the Terminal Server Role, Installing Terminal Server Licensing , Installing the Remote Desktop Connection Utility, Configuring the Remote Desktop Connection Utility, Installing the Remote Desktops MMC Snap-In, Installing the Remote Desktop Web Connection Utility.

Managing and Troubleshooting Terminal Services

Using Remote Assistance as a Novice
Using Remote Assistance as an Expert
Completing a Remote Assistance Connection
Managing Remote Assistance Invitations
Using the Remote Desktop Connection Utility
Using the Terminal Services Manager
Using the Terminal Services Configuration Tool
Managing Terminal Services Server Settings
Managing Terminal Services Sessions at the User Level
Controlling Terminal Services with Group Policy
Using Terminal-Services Command-Line Tools
Configuring Terminal Server in Application Server Mode
Troubleshooting Terminal-Services

Using Server Management Tools
Understanding Management Tools
Understanding Remote Assistance and Administration
Using Computer Management to Manage a Remote Computer
Using Emergency Management Services
Configuring Printers
Managing Printers and Print Queues
Managing Printers with Command-Line Tools
Configuring Services
Managing Services
Managing Services with Command-Line Tools
Using Server Management Wizards

Managing Web Servers with IIS 6.0
Preparing to Install IIS 6.0
Installing and Configuring IIS 6.0
New Features of IIS 6.0
Setting Up Web Sites with IIS Manager
Administering Web Sites with IIS 6.0
Managing IIS 6.0 Security
Troubleshooting IIS 6.0
Creating and Managing Web Sites with Command-Line Utilities
Creating Virtual Directories with Command-Line Utilities
Administering FTP Sites with Command-Line Utilities
Creating Virtual Directories for FTP Sites with Command-Line Utilities
Creating IIS Backups with Command-Line Utilities
Managing IIS 6.0 Configuration Settings with Command-Line Utilities

Section III

Monitoring Performance and Security
Using Task Manager, Using System Monitor, Using Performance Logs and Alerts, Using Command-Line Tools, Monitoring Memory Objects, Monitoring Network Objects, Monitoring Process Objects, Monitoring Disk Objects, Auditing Security Events, Enabling Object Auditing, Working with Audit Policy Settings, Using Event Viewer
Managing Event Logs, Troubleshooting Event Logs, Managing Events with Command-Line Tools, Monitoring Shutdown Events, Tracking Shutdown Events

Planning Disaster Recovery
Understanding Disaster Recovery
Developing a Business Continuity Plan
Assessing Threats
Evaluating Assets
Creating an Incident Response Team
Using Disaster Recovery Best Practices
Creating a Backup Plan
Understanding Backup Concepts
Choosing Backup Media
Managing Backup Media

Implementing Disaster Recovery

Using Emergency Management Services, Backing Up Data Files, Setting Backup Options, Backing Up System State Options, Configuring Security for Backup Operations

Delegating Authority to Perform Backups via Group Policy, Verifying Successful Completion of Backup Jobs, Managing Backup Media, Restoring Data from a Backup

Scheduling Backup Jobs, Performing Backups with Command-Line Utilities , Creating a System Recovery Plan, Restoring Active Directory, Creating an Automated System Recovery Set, Installing and Using the Recovery Console , Using Windows Startup Options, Creating Volume Shadow Copies , Restoring Data from within Volume Shadow Copies, Recovering from Server Hardware Failure

BScHNT-503   Microsoft Windows Network Infrastructure

Section I

TCP/IP Protocol

OSI networking model: physical and data link layers, Network and transport layers, Session, presentation, and application layers , Microsoft networking model , Protocol suite network interface layer, Protocol suite internet layer , Protocol suite host-to-host transport layer, Protocol suite application layer

IP Addressing and Routing

IP addresses and binary conversions, Network ID and host ID, Classes

Subnetting and subnet masking, Custom subnet masks, Public and private IP addresses

IP routing name resolution, IP routing tables, ARP, RARP, Static and dynamic IP routers

Routing utilities and example network

Classless Subnet Masking and Client Address Configuration

Classless subnet masking, Subnetting Class B networks , Subnetting Class C networks

Example classless subnetting, Supernetting a Class C network, The Windows XP/2000 routing table, Windows XP/2000 routing table entries , The Windows 2003 routing table

Disabling automatic metric calculation, Adding and removing routing table entries , Assigning static IP addresses , Assigning dynamic IP addresses and APIPA

Section II

The Dynamic Host Configuration Protocol

DHCP leases, The DHCP lease process, Lease renewal, installing the DHCP service, Configuring scopes, Configuring server and scope options, Configuring user and vendor class options, Configuring reservations and BOOTP tables, Superscopes, Multicast scopes, IP address allocation

Integrating and Troubleshooting DHCP

Configuring the DHCP relay agent, DHCP server and Dynamic DNS, DHCP and Routing and Remote Access, DHCP and Active Directory, Automatic private IP addressing

User Classes & Vendor Classes, Managing the DHCP server database, Server statistics and administration, Monitoring DHCP, Data sniffing and audit log, Log files and client-side troubleshooting

Windows Internet Name Server (WINS)
Overview of WINS, Installing the WINS server, Creating replication partners, Configuring pull replication, Configuring push replication, Managing WINS records, Creating static records, State and expiration fields, Record reconciliation and integrity, Database consistency, Database size and advanced options, WINS database backup,
Ntbackup and database restores.

WINS Client and Interoperability and NetBIOS
Configuring the WINS client
WINS and DHCP
WINS and DNS
WINS and RRAS or Active Directory
WINS and Browser service or Win9x/NT clients
WINS System Monitor Objects
Troubleshooting WINS Clients
Troubleshooting WINS servers
NetBIOS name resolution
Name registration and resolution
NetBIOS terminology
NetBIOS node types
The LMHOSTS file

Section III

Domain Naming System Concepts
DNS overview, Name conventions and resolution, The DNS namespace
Basic DNS concepts, Zones and records , Adding records and zone transfers
Host name resolution, Server roles and testing, Adding zones, Dynamic DNS servers
Stale records and extensions, AD integrated DNS zones

The DNS Server
Installing the configuring the DNS server, Configuring forward lookup zones, Adding DNS database records, Configuring reverse lookup zones, Configuring your DNS server
Configuring your DNS zones, Configuring DNS clients, Resolving DNS queries
Integrating the DNS server with DHCP, DNSUpdateProxy group security, WINS and DNS, Integrating the DNS server with BIND, Monitoring the server with DNS console
Monitoring the server with System Monitor, Monitoring the server with Network Monitor
Troubleshooting the DNS server.

Routing and Remote Access Service VPN Services
Remote access concepts, Enabling remote access, VPN server network structure
VPN server infrastructure, PPP authentication process, PAP and SPAP, Authentication protocols
CHAP, MS-CHAP, and EAP, VPN tunneling protocols, Configuring the VPN server, Configuring the VPN server for remote access, Configuring the VPN remote access clients, VPN gateway infrastructure, Demand-dial connections and IP addressing support, Creating gateways and static packet filters, VPN gateway configuration
Troubleshooting VPN services.

BScHNT-504   Implementing and Managing Microsoft Exchange Server

Section I

Introduction to Mail Server
Overview of Exchange Server 2003, preparing a new Exchange environment
Installation, Unattended installation in a clustered environment
Post-installation configuration Upgrading from Exchange Server 2000
Establishing coexistence, Migration wizards, Migration from other messaging systems

Managing Exchange Recipient Objects
Understanding Exchange recipients, Creating new users, Mailbox-enabling users, Deleting and moving mailboxes, Modifying email addresses, Hiding and reconnecting mailboxes, Configuring mailbox storage limits, Configuring permission, Managing contacts, Managing groups, Creating query-based distribution groups, Using expansion servers

Section II

Managing Address Lists and Policies
Understanding Exchange address lists, creating global address lists, creating custom address lists, creating offline address lists, Hiding address lists, and Forcing address lists, Setting mailbox store policies, Setting public folder store and server policies, Setting recipient policies, Managing system policies, Managing recipient policies

Managing the Exchange Organization
Understanding public folders, Permissions, replication, and referrals, Creating public folders, Managing replication and referral, Managing full-text indexing, Troubleshooting public folders, Understanding virtual servers, Managing virtual servers
Limiting inbound connections, Managing SMTP relay settings, Front-end/back-end arrangements.

Section III

Managing Computers and Performance
Understanding clustering, Cluster models, creating a cluster, Planning Exchange backups, Performing Exchange backups, Understanding restoration strategies,Restoring Exchange data, Removing Exchange servers, Understanding client connectivity, Using monitoring tools, Using system monitor, Managing data storage

Security and Troubleshooting
Managing connectivity across firewalls, Managing audit settings, Managing permissions
Understanding encryption and digital signatures, Managing encryption and digital signatures, Detecting security threats, Troubleshooting mail queues
Troubleshooting DNS issues, Troubleshooting Active Directory issues, Troubleshooting networking issues

BScHNT – 601   Linux Server Management

Section I

Linux system administration
Linux Booting Procedure
Understanding /etc/inittab
Understanding Boot Loader (Grub)
Single user mode
Boot loader protection

Understanding Disk partition
Post installation Hard disk partitioning
Mounting and Unmounting file system
Formating partition
Understanding /etc/fstab

Red hat Package Manager (RPM) and YUM Client
Software RAID concept & practical
LVM concept & practical
ACL Concept & Practical
User & Group Quota Concept & Practical

Networking in Linux
Configure Linux Network
system-config-network
Dynamic ip addressing
Static ip addressing
Virtual ip addressing

Section II

Network Server Management
Installing and Configuring NFS server
Installing and Configuring Samba server
Installing and Configuring ftp server using vsftpd
Installing and Configuring Web server using apache
Installing and Configuring Proxy server using Squid
Installing and Configuring DHCP server
Installing and Configuring DNS server

Section III

Advance Server Management
Red hat Package Manager (RPM) and YUM Server
NTFS Mounting,

Multimedia Features
Printer Server
Bluetooth
SELinux
Virtualisation

BScHNT-602   Wireless Networking

Section I

Introduction to Wireless Communication Systems
Evolution of mobile radio communications, Mobile radio systems around the world
Radio communication systems – paging systems, cordless telephone systems, cellular telephone systems
Comparison of common wireless communications, trends in cellular radio and personal communication
Second generation (2G) cellular networks
Third generation (3G) wireless networks
Introduction to radio wave propagation, Free space propagation model

Section II

Basics of mobile communication
Limitations of conventional mobile system
Mobile cellular communication: introduction, concept of frequency reuse, cluster size Cellular system architecture: mobile station, base station, MSC, channel assignment strategies, call handover strategies, interference and system capacity
Improving capacity in cellular systems – cell splitting, sectoring, repeaters
Microcell zone concept

Global system for mobile communication
GSM services and features, system architecture
GSM radio subsystem
GSM channel types, location updating and call setup
Introduction to CDMA digital cellular standard
Comparison between GSM and CDMA

Section III

Wireless networking
Wireless local area network standards
Technology – RF and IR wireless LAN, diffuse, quasi-diffuse and point-to-point IR wireless LAN
Advantages and applications of Wireless LAN
Introduction to WI-FI, Bluetooth, 3G and 4G wireless systems
Wireless LAN in Windows Network
Introduction to satellite communication
Brief history and overview of satellite communication

BScHNT-603   Security Essentials

Section I

System Vulnerabilities, Threats & Risk.
Asset & Risk Identification.
Confidentiality, Intrigrity & Avalaivality.
Authentication, Authorisation.

Section II

Data Security
Data Recovery & Wiping
Precautionary measures - Disk Editor
Firewall Configuration
Anti Spyware and SPAM Protection
Backup & Restore
Disaster Recovery.
RAID5

Section II

Other Security Issues
Remote Desktop and VNC
Configuring Skype
Security Issues in Wireless Routing.
Securing FTP Server
IPSec Policy
Certificate authority server - Configuring SSH
Connecting mobile to pc & virus scanning in mobile devices

BScHNT-604   Project   Duration: 22 Hours

Title: PC Assembling

Team Size: Max 4 Students

Objective/ Aim: Assembling a working Personal Computer in a most competitive cost.

Steps Involved:

Step 1: Hardware Market Study visiting different vendors.

Step 2: Collecting quotation of prices for different hardware components.

Step 3: Comparative analysis of quotations and define the most cost effective combination of components from different vendors.

Step 4: Procuring the selected components of step 3 and assembling those to make a personal computer.

Step 5: Installing any Linux distribution as Operating System and few other commonly used application software.

Step 6: Submitting the project documentation.