Course Name: Understanding the Personal Computer
Course Code: PGDNA111

Objectives:

Students will learn

- Create an awareness of various components of Computer Systems
- Learn to maintain, upgrade, and troubleshoot your PC system.
- Provide experience in upgrading and repairing Personal Computers

Prerequisites:

Basic knowledge of Computer Science

1. **PC Components, Features, and System Design**: History of the PC, Birth of the Personal Computer, the IBM Personal Computer, the PC Industry 30 Years Late. PC components, Features, and System Design, Processor Types and Specifications: Microprocessor History, Processor Specifications, Processor Features, Processor Socket and Slot Types.

2. **Primary Memory :** Memory Basics, ROM ,DRAM ,Cache Memory, SRAM .Memory Standards Speed and Performance ,Fast Page Mode, Extended Data Out RAM, SDRAM .Memory Modules ,Determining a Memory Module's Size and Features, Memory Banks ,Memory Module Speed, RAM Upgrades Purchasing Memory, Installing Memory Modules .

3. **Magnetic, Optical and other Secondary Memory :** Magnetic Storage, History of Magnetic Storage, How Magnetic Fields Are Used to Store Data, **Hard Disk Storage,** Definition of a Hard Disk, Hard Drive Advancements, Tracks and Sectors, Disk Formatting , **Flash and Removable Storage,** Alternative Storage Devices ,Flash Memory Devices, CompactFlash, SmartMedia, MultiMediaCard Sony Memory Stick etc. Cloud-Based Storage. Optical Technology ,CD-Based and DVD based Optical Technology

4. **Video and Audio Hardware:** Display Adapters and Monitors, Video Display Adapters, Video Adapter Types, Integrated Video/Motherboard ,Chipsets ,CPUs with Integrated Video Monitors ,Display specifications ,Monitors: LCD, LED, CRT, Plasma Display ,LCD and DLP Projectors.Early PC Sound Cards, Limitations of Sound Blaster Pro Compatibility ,Microsoft Windows and Audio Support

5. **Building or Upgrading Systems:** System Components, Case and Power supply, Processor, Motherboard ,Memory, I/O ports, Hard Disk/Solid-State Drives, Removable Storage, Input Devices, Video Card and Display, Audio Hardware, Accessories, Hardware and Software Resources, System Assembly and Disassembly.

Main Reference Book(s):

1) Mueller Scott, “Upgrading and Repairing PCs”, Pearson India
2) Anfinson David, Quamme Ken, “IT Essentials – PC Hardware and Software Companion Guide”, Cisco Press, Pearson India
3) Holcombe, “A+ Certification Study Guide”, Tata McgrawHill
4) Pyles James, “PC Upgrade and Repair Street Smarts”, Wiley India
5) Chase, “PC Hardware and A+ Handbook”, Microsoft Press, PHI

Accomplishments of the student after completing the course:

At the end of the work student will be able to

- Appreciate the principles underlying the functioning of computer system and operating systems, describe the problems and challenges associated with it, and evaluate the effectiveness and shortcomings of their solutions
- Perform basic tasks of lab administrator / lab technician
- Setup and maintain computer labs

Course Name: Networking-1
Course Code: PGDNA112
Objectives:

Students will learn

- Introduce principles of Computer Networks
- Hardware and Software components necessary for building a Network

Building and trouble shooting a network.

Prerequisites:

Computer fundamentals.

1. **Introduction to Computer Networks:** Fundamentals of Network Communication, Network terms, network models, Network Servers.
2. **Network Hardware Essentials:** Network repeaters and hubs, Network Switches, Wireless Access points, Network Interface Cards, Routers.
3. **Network Topologies and Technologies:** Network Topologies: Bus, Star, Ring, Point-to-point, Ethernet networks and Standards , WIFI, Token Ring Networks ,Wireless Access Point, Advanced features of NIC.
4. **Network Operating System Fundamentals:** Operating system fundamentals, Network Operating System-Role of Client and Server Operating System, Centralized User Account and computer management, Server and Network Fault Tolerance. Operating System Virtualization, Installing an OS.
5. **Server Management and Administration:** Managing User and Group Accounts, Storage and file System Management, Working with Shared files and Printers, Monitoring system Reliability and performance. Backup and Fault tolerance.

Main Reference Book(s):

1) Gregory Tomsho, “Guide to Networking Essentials 6e”, Cengage Learning
2) Michael Parmer, “ Hands On Networking Essentials”, Cengage Learning
3) Paul Browning, CISCO CCNA simplified, Cisco Press

Accomplishments of the student after completing the course:

At the end of the work student will be able to

- Understand and build networks using the components
- Understand Network Topologies and learn to install Network Operating System
- Understand network design concepts server administration.

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Course Name: Wireless Communication and Mobile Phone Technology

Course Code: PGDNA113

Objectives:

Students will learn

- To introduce the principles of Wireless communication.
- To understand various types of Wireless networks, related services and protocols.
- To gain hands-on experience on configuring, managing, troubleshooting and securing Wireless networks.

Prerequisites:

Basics of Computer Science

Contents:

1. **Introduction to Wireless transmission & Mobile Communication**
   Frequencies for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems, Regulatory and Technical Organizations, Wireless Communication Building Blocks, Wireless Standards, Client Side Wireless Hardware, Infrastructure side Wireless Hardware.

2. **Channel Access Methods**
   MAC, SDMA, FDMA, TDMA, CDMA, GSM – Services and System Architecture.

3. **Classification of Wireless Networks**
   Wireless Local Area Networks, Components, Wireless Wide Area Networks, Wireless Metropolitan Area Networks, Wireless Personal Area Networks, Emerging Technologies.

4. **Protocols and Security in Wireless Networks**
   Infrastructure Services and Protocols, Securing Wireless Networks.

5. **Configuration, Deployment and Troubleshooting**
   Infrastructure Device Configuration, Configuring MS Windows Clients, Configuring Linux Clients, Wireless Network Planning and Designing Considerations, Site Survey, Wireless Site Deployment Examples, Troubleshooting Wireless Networks.

6. **Mobile Ad-hoc and Sensor Networks**

Introduction to Mobile Ad-hoc Network, MANET, Wireless Sensor Networks, Applications.

Main Reference Book(s):

4) Soyinka Wale, "Wireless Network Administration", TMH
5) Rappaport T.S., "Wireless communications, principles and practices", Pearson Education
6) Rajkamal, "Mobile Computing", Oxford Press
7) Ashoke K Talukder and Roopa R Yavagal, "Mobile Computing", Tata McGrawHill
8) Fecher K., "Wireless Communications", Wiley India
9) Schiller J., "Mobile Communications", Pearson Education.

Accomplishments of the student after completing the course:

At the end of the work student will be able to

- Appreciate various technologies related to Wireless Networking.
- Ability to Plan and Deploy Wireless Networks.
- Configure, Secure and Troubleshoot Wireless Networking Devices.

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Course Name: Linux and Shell Scripting

Course Code: PGDNA114

Objectives:

Students will learn

- Appreciate the Linux & Unix Operating System
- Get acquainted with the Linux Commands
- Get an Insight of Shell scripting for Administrative Tasks.

Prerequisites:

Fundamentals of Operating Systems

Contents:

1. **Overview of Linux & Unix:**
   Introducing Linux and Unix as a Network Operating System, History of Unix & Linux, Distributions of Linux, Basic Commands, Files and File Organization, File Attributes and Permissions, Vi Editor

2. **Standard I/O, Redirection Pipes and Filters :**
   Standard I/O, Redirection, Pipes, Filters, Regular Expressions, Sed, Awk

3. **Commands and Utilities:**
   Environment Variables, Processes and related commands, Basic communication tools, Utilities for System Administration, Commands for File Systems

4. **Shell Programming:**
   Shell variables, Positional Parameters, Branching control structures, Loop-control structures, Continue and break statements, Arithmetic calculations in Shell Programs, Debugging Scripts

5. **Scripting for Administration:**
   Processing Files, Process Monitoring and Enabling Pre-Processing, Startup, and Post-Processing Events, Random Password Generation, Monitoring Processes and Applications, File-system Monitoring, Monitoring Paging and Swap Space, Monitoring System Load, Automated Hosts Pinging with Notification of Failure, Creating a System-Configuration Snapshot, Compiling, Installing, Configuring, and Using sudo, Monitoring and Auditing User Keystrokes

Main Reference Book(s):

1. Venkateshmurthy M.G. “Introduction to Unix & Shell Programming”, Pearson Education
2. Das Sumitabha, “Unix Concepts and Applications”, Tata McgrawHill
3. Randal Michael, “Mastering Unix Shell Scripting”, Wiley Publication
4. Foster E., Anderson M. et al., “Beginning Shell Scripting”, Wrox Publication
5. Sarath Lakshman, “Shell Scripting CookBook”, PACKT Publishing

Accomplishments of the student after completing the Course:

- Efficiently perform the tasks of a Network Administrator.

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Course Name: Practicals-I

Course Code: PGDNA115

Objectives:

Students will learn

- To appreciate the use of Shell Scripting for Network Administration
- To learn to assemble and deassemble PC
- Learn to setup and administer LAN

Prerequisites:

Linux OS

Contents:

1. **Hands on network building and network administration**.

2. **Linux Shell Scripting**

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