

# Detailed Syllabus – Computer Hardware and Networking Associate

Duration: 1 Year

<b>Module – 1</b>	<p><b>Fundamentals of IT</b></p> <p><b>Unit -1 Computer Fundamentals</b></p> <p><b>Knowing computer-</b> What is a Computer, Characteristics of a Computer, Advantages and Disadvantages of a Computer, History of Computer, Generation of Computer, Classification of Computers, and Basic Application of Computer.</p> <p><b>Components of computer-</b> Input unit, Arithmetic and logic unit, Control unit, Storage /Memory unit, Output unit</p> <p><b>Computer Memory-</b> What is computer memory, Types of memory, Difference between Primary memory &amp; Secondary memory</p> <p><b>Concepts of Hardware and Software -</b> Definition of Hardware and Software, Input devices, Secondary Storage devices, Output devices, System software, Application Software.</p> <p><b>History of Computer Language-</b> Introduction to program &amp; programming Language, First Programming Language(Machine language),Assembly language, High level language, translators (Assembler, Compiler &amp; Interpreter).</p> <p><b>Working with Windows -</b> Introduction to windows and its features, Components of windows (desktop, icons, start button etc.), Operations on windows, Managing files and folders, Control Panel, Personalizing your window, Window Accessories, Improve computer performance using utility tools (Disk fragmentation, disk cleaner, backup, Antivirus, compression tools)</p> <p><b>Introduction to multimedia-</b> What is multimedia, elements of multimedia (Text, Image, Fonts, Audio and Video), different formats of image, audio and video files, playing audio &amp; video in computer system, application of multimedia in various fields.</p> <p><b>Unit- 2 Office Automation Package</b></p> <p><b>Word:</b> Word processing Basics, Text creation and Editing, Formatting text and Paragraph, Header and footer, graphics, table, Mail merge, Page setup and Print.</p> <p><b>Excel :</b> Elements of spread sheet, Manipulation of cells, Formula and Functions, Managing Data, charts and Graphs, Page Setup and Print</p> <p><b>PowerPoint:</b> Basics of presentation, slide preparation and inserting objects, templates and color schemes, animations and slide presentation, printing handouts.</p>
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<b>Module – 2</b>	<b>Connecting to the World</b>  <b>Unit- 1 Internet &amp; E-mail</b> Introduction to Internet, Advantages and disadvantages of internet, Domain Name System, Internet Connectivity, Web browsers & Search Engines, Navigating through web, Uploading & Downloading, Services on web, Using social media sites, Introduction to E-mail, E-mail addressing, Creating new email account, Composing and sending email, Replying and forwarding, Sorting and searching email, Sending email to multiple users, Sending attachments. Introduction to e-governance services, Types of Interactions in e-Governance  <b>Unit – 4 Online Data storage : Cloud</b>  What is cloud and cloud storage, benefits of online storage over local storage and portable storage, Types of cloud storage (Public, private, hybrid and community cloud), cloud storage service providers).
<b>Module – 3</b>	<b>Basic Electronics</b>  <b>Unit-1 Analog</b> Current, Voltage & Resistance, Passive Components (Resistors, Capacitors, Inductors, Transformers), Active Components (Semi-Conductors, Diodes, PN Junctions), Transistors (PNP, NPN, FET & MOSFET), Rectifiers ( Half Wave, Full Wave, Bridge Rectifiers), Integrated Circuits (IC), Semi- Conductor memory, Soldering & Soldering techniques, Power Supply(DC Power supply, AC Power supply, Linear Regulator, Batteries, Uninterrupted Power supply & switched mode Power supply)  <b>Unit-2 Digital</b> Number Systems and its conversions, BCD Numbers, ASCII Code, Boolean Algebra, Logic Gates & Truth Tables, Half Adder & Half Subtractor, Multiplexer and DE multiplexer, Encoder & Decoder, Flip Flops and Types of Flip Flops, Latches, Registers & Counters, Trouble shooting
<b>Module - 4</b>	<b>Computer Hardware &amp; Peripherals</b>  <b>Unit-1 Internal Components</b> Microprocessor, PC Architecture, Motherboard, Memory (Primary & Secondary), Chipset, BIOS and POST, IDE/PATA & SATA Devices(Hard Disk Drive and CD/DVDs Drives), SMPS, Zip Drive, Backup Drive, Expansion Cards- LAN Card, IDE Card, VGA and SVGA Cards, Sound Card, Interface Card, I/O Cards, Video Cards, USB Card, Fire-Wire Cards, Internal Ports, Cables and Connector Types.  <b>Unit-2 External Components</b>

	<p>Monitor and types of Monitors, Printers and types of Printers, Scanner, Keyboard, Mouse, Modem, Digital Camera, Sound, Ports and Connectors, Batteries, Power Supply, Pen Drives, SCSI interface devices, Web Camera, CCTV Camera, Projector.</p> <p><b>Unit- 3 Assembling &amp; Disassembling of Computer</b>  Overview of the Assembly Process and Safety Issues, Install the Power Supply, Attach the Components to the Motherboard, Install the Motherboard, Install Internal Drives, Connect all Internal Cables, Install Motherboard Power Connections, Connect External Cables to the Computer, Boot the Computer For The First Time, Procedure for Computer Disassembling, installing various external components.</p> <p><b>Unit-4 PC Troubleshooting</b>  Identifying and solving common issues such as - Computer doesn't start, devices not working /responding, No display on monitor, Applications running slowly, Not enough space etc. Handling issues related to printer (paper jam, printer isn't printing, paper size mismatch, Printer error etc.), Handling issues related to scanner (paper jam, poor image quality etc.).</p>
<p><b>Module - 5</b></p>	<p><b>Operating System</b></p> <p><b>Unit-1 Operating System &amp; Software Installation</b>  Introduction to Operating System, Types of operating systems, Functions of Operating System, System files(FAT and NTFS), Relation between System File and operating System, Changing System file format Window installation, Unix and Linux , Installing application software and settings, Backup and Restore, Trouble shooting and referring manuals</p> <p><b>Unit-2 Protection from Virus</b></p> <p>Introduction to Computer Virus, Virus Types (Malware, Trojan, Horse Worm, Spyware and Adware) Common Signs of Virus (Window Popup, Self-Executing Program, Frequent Accounts Logout, Device Crashing), Protecting computer from virus( Use Anti-virus Software, avoid click Pay attention to windows smart screen notification, Keep Windows updated, Use browser privacy settings, Set administrator level permissions, Email Scanning, File Scanning)</p>

## Module - 6

## Network Essentials & Management

### Unit-1 Basic Concepts of Network

What is Network, Computer Network Architecture (Peer to Peer network and Client/ Server network), Network Types (LAN, MAN, WAN), Internetwork and types of internetwork( Intranet and Extranet), Network Topologies, Transmission Media (guided/Wired & unguided/Wireless), Networking Model( OSI & TCP/IP), Protocol and types of internet protocol(TCP/IP, HTTP, FTP, SMTP, PPP, TELNET, UDP, IPV4, IPV6)

### Unit-2 Network Hardware & Components

Networking Devices (Modem, NIC, HUB, Bridge, Switch, Repeaters, Router, Gateway etc.), Network Cables and Connectors, Type of Cables(Twisted pair cable, Coaxial cable, Fibre-optic cable)

### Unit- 3 IP Addressing & Sub-netting Basics

Introduction to IP Addressing, Types of IP Address, Format of IP Address, IP Classes, subnet mask, Default gateway, Configuring IP address.

### Unit-4 Wireless Networking Basics

Introduction to Wireless Networks, Types of Wireless Networks(WPAN, WLAN, WMAN,WWAN), Introduction to Wi-Fi(Wireless Fidelity), How WI-Fi works, Wi-Fi Standards (IEEE 802.11b, IEEE 802.11a IEEE 802.11g, 802.11ac), Elements of Wi-Fi networks (Access point, Wi-Fi cards, Safeguards), Introduction to Bluetooth, features of Bluetooth, Spectrum, Range, Data rate,Wi-Fi Versus Bluetooth, , Bluetooth protocol stack.

### Unit-5 Networking Troubleshooting

What is troubleshooting a network, why troubleshooting is important, Common causes of network problems(Cable Problem, Connectivity Problem, Configuration Issue, Software Issue, Traffic overload, Network IP issue), Basic Network Troubleshooting Steps(Identify the problem, Develop a theory, Test the Theory, Plan of Action, Implement the solution, Verify System functionality, Document the Issue), Network Troubleshooting Tools (Ping, Traceroute / Tracert, Ipconfig / Ifconfig, Nslookup, Whois, Netstat, PuTTY / Tera Term, Subnet and IP calculator , Speed test, IP Scanner), Hardware Tools for network troubleshooting(Wire Crimper, Cable Tester, Punch Down Tool, Light Meter, Multimeter etc)

### Unit – 6 Network Security

What is Network Security, Need of Network Security, Network Security attacks (Active and Passive), Types of Security Services(Access Control, Authentication, Integrity, Confidentiality, Non-repudiation), Network Security Components (Antivirus & Spyware, Firewall, Intrusion Prevention System, Virtual private networks (VPNs)), Security Tools (Anti-virus software packages, Secure network infrastructure, DNS hardware & software, Virtual Private Network, Identity services, Encryption, Security management), Security Protocol (Transport Layer Security, Point to Point protocol, Internet protocol security)

<b>Module - 7</b>	<p><b>Server Installation &amp; Administration</b></p> <p><b>Unit -1 Installing &amp; Configuring Servers</b>  Server, Types of Servers, System Requirement, Installing Windows Server/Linux/Unix Server, Configuring server roles &amp; features, Installing and administering Active Directory, Managing User Account, Installing &amp; Configuring DNS, DHCP, IIS Web Server, File Server, Print Server, Installing networking &amp; storage devices like DAS, NAS, SAN, RAID.</p> <p><b>Unit-2 User management and Group Policy management</b>  Introducing Group Policy, Create and Edit GPO, Windows Settings, Configuring Windows Firewall, Control Panel Settings, Startup, Shutdown, Logon, and Logoff Scripts, Delegate Permissions for Group Policy</p>
<b>Module - 8</b>	<p><b>Employability Skills</b></p> <p>Introduction to Employability Skills, Constitutional values – Citizenship, Becoming a Professional in the 21st Century, Basic English Skills , Career Development &amp; Goal Setting, Communication Skills, Diversity &amp; Inclusion, Financial and Legal Literacy, Essential Digital Skills, Entrepreneurship, Customer Service, Getting Ready for Apprenticeship &amp; Jobs</p>
<b>Module – 9</b>	<b>OJT</b>