

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:

**Field Technician – Computing and
Peripherals**

(QUALIFICATION PACK: Ref. Id. ELE/Q4601)

SECTOR: Electronics

Classes 11 and 12



**PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
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1. COURSE OVERVIEW

COURSE TITLE: Field Technician – Computing and Peripherals

Field Technician also called 'Service Technician', the Field Technician provides after sale support services to customers, typically, at their premises. The individual at work is responsible for attending to customer complaints, installing newly purchased products, troubleshooting system problems and, configuring peripherals such as printers, scanners and network devices. The job requires the individual to have ability to build interpersonal relationships and critical thinking. The individual must be willing to travel to client premises in order to attend to calls at different locations.

COURSE OUTCOMES: On completion of the course, students should be able to:

- ✓ Apply effective oral and written communication skills to interact with customers;
- ✓ Identify the principal components of a computer system;
- ✓ Demonstrate the basic skills of using computer;
- ✓ Demonstrate self-management skills;
- ✓ Demonstrate ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- ✓ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ Explain basic electronics and components;
- ✓ Explain computer system hardware and software product and their functionalities;
- ✓ Identify the computer parts and peripherals;
- ✓ Operate various tools and equipment for installation;
- ✓ Assemble and install the computer system and configure the peripherals;
- ✓ Check and ensure functioning of system;
- ✓ Configure peripherals and network devices;
- ✓ Install and navigate an operating system.
- ✓ Upgrade or replace components of a laptop based on customer needs;
- ✓ Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.
- ✓ Understand the symptoms and identify the fault;
- ✓ Identify system level problem on field and make decision;
- ✓ Undertake basic troubleshooting of computer system and peripherals;
- ✓ Understand under warranty incidents;
- ✓ Perform preventive maintenance and advanced troubleshooting;
- ✓ Understand customer's requirements and suggest possible solution;
- ✓ Follow Do's and Don'ts while handling field calls and dealing with customers;
- ✓ Attend to field calls from customer and complaints for system trouble shooting and repairs.
- ✓ Assess customer needs, analyze possible configurations, and provide solutions or recommendations for hardware, operating systems, networking, and security.

COURSE REQUIREMENTS: The learner should have basic knowledge of science.

COURSE LEVEL: This course can be taken up at Intermediate level in Class 11 and Class 12.

COURSE DURATION: Total : 600 hrs

Class 11 : 300 hrs

Class 12 : 300 hrs

2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Class 11 and 12 opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Class 11 is as follows :

CLASS 11			
	Units	No. of Hours for Theory and Practical 300	Max. Marks for Theory & Practical 100
Part A	Employability Skills		
Unit 1	Communication Skills – III	25	10
Unit 2	Unit 2: Self-management Skills – III	25	
Unit 3	Unit 3: Basic ICT Skills – III	20	
Unit 4	Unit 4: Entrepreneurial Skills – III	25	
Unit 5	Unit 5: Green Skills – III	15	
	Total	110	10
Part B	Vocational Skills		
Unit 1	Basic Electronics and Computer Hardware Essentials	50	40
Unit 2	Installation and Configuration of Desktop Operating System	40	
Unit 3	Computer Maintenance and Troubleshooting	60	
Unit 4	Occupational Health and Safety Practices	15	
	Total	165	40
Part C	Practical Work		
	Practical Examination	6	15
	Written Test	1	10
	Viva Voce	3	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/ Student Portfolio	10	10
	Viva Voce	5	5
	Total	15	15
	Total	300	100

The unit-wise distribution of hours and marks for **Class 12** is as follows:

CLASS 12			
	Units	No. of Hours for Theory and Practical 300	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
Unit 1	Communication Skills – IV	25	10
Unit 2	Self-management Skills – IV	25	
Unit 3	Basic ICT Skills – IV	20	
Unit 4	Entrepreneurial Skills – IV	25	
Unit 5	Green Skills – IV	15	
	Total	110	10
Part B	Vocational Skills		
Unit 1	Computer Network Essentials	30	40
Unit 2	Installation and Configuration of Network Operating System Windows Server	30	
Unit 3	Installation and configuration of Network Operating System Linux Server	30	
Unit 4	Computer Network Maintenance and Troubleshooting	40	
Unit 5	IT Security	20	
Unit 6	Information Technology Infrastructure Library (ITIL) v4	15	
	Total	165	40
Part C	Practical Work		
	Practical Examination	6	15
	Written Test	1	10
	Viva Voce	3	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/ Student Portfolio	10	10
	Viva Voce	5	5
	Total	15	15
	Total	300	100

5. UNIT CONTENTS

CLASS 11

Part A	Employability Skills, Class 11	Duration in Hours
Unit 1	Communication Skills – III	25
Unit 2	Self-management Skills – III	25
Unit 3	Basic ICT Skills – III	20
Unit 4	Entrepreneurial Skills – III	25
Unit 5	Green Skills – III	15
Part A	Vocational Skills, Class 11	110 Hours
Unit 1	Basic Electronics and Computer Hardware Essentials	50
Unit 2	Installation and Configuration of Desktop Operating System	40
Unit 3	Computer Maintenance and Troubleshooting	60
Unit 4	Occupational Health and Safety Practices	15
		165 Hours

Class XI, Unit 1: Basic Electronics and Computer Hardware Essentials

Sn	Learning Outcome	Theory (20 Hours)	Practical (30 Hours)	50 Hr s
1.	Describe the basic concepts of electrical and electronics	<ul style="list-style-type: none"> • Concept of electricity, • Electrical quantities – current, voltage, AC and DC, • Electronic components – active and passive components, • Active components – semiconductor diode, transistor, • Passive components – Resistor, capacitor, inductor • Transformer, • Basics of digital electronics, • Integrated Circuit (IC), • Semiconductor memory, • Power supply and its types, • Batteries, • Switched Mode Power Supply, • Uninterrupted Power Supply • Printed Circuit Board and its types, • Soldering and de-soldering, 	<ul style="list-style-type: none"> • Illustrate the energy foundation and concept of electricity, • Define electrical quantities – voltage, current, resistance, • Identify, name and check the given electronic components, • Identify and test digital gates, • Identify and test transformer, • Identify Integrated Circuit, • Identify semiconductor memory, • Identify and test power supply and its types, • Identify and test batteries, • Identify and test Switched Mode Power Supply, • Identify and test Uninterrupted Power Supply • Identify Printed Circuit Board and its types, • Illustrate the soldering and de-soldering. 	15
2.	Describe the main	<ul style="list-style-type: none"> • Computer as a system, 	<ul style="list-style-type: none"> • Identify the computer 	5

	components of computer system	<ul style="list-style-type: none"> • Characteristics and limitations of computer, • Generation of computer, • Hardware and software, • Main components of computer System, • Classification of computer. 	<p>hardware and software,</p> <ul style="list-style-type: none"> • Identify and name the main components of computer, • List the classification criteria of computer, • Classify the given computer, • Identify the various computers and determine its type, 	
3.	Identify and connect internal components of computer hardware	<ul style="list-style-type: none"> • Motherboard – types, functionality, form factor, working, connectivity, ports and connectors • CPU – types, functionality, form factor, working, connectivity, • Memory – types, functionality, form factor, working and connectivity, 	<ul style="list-style-type: none"> • Identify and connect motherboard, • Identify various ports and connectors on motherboard, • Connect various devices on ports of motherboard, • Identify and connect CPU, • Identify and connect memory modules. 	8
4.	Identify and connect Input/ Output devices	<ul style="list-style-type: none"> • Input devices, • Types of input devices – Text input devices, Pointing devices, Audio visual input devices, Input card readers, Input Reading Text / Codes, Input Sensors, Scanners, • Output devices, • Types of output devices, • Soft copy output devices – Monitors, LCD, LED monitors, • Hard copy output devices – Printer, plotter • Audio output devices, • Connectivity of Input/Output devices to the computer system. 	<ul style="list-style-type: none"> • List and name the various types of input devices, • List the features of various input devices, • Identify and connect various input devices, • Identify and name the various types of monitors, • Compare the features of different types of monitors, • Identify and name the various types of printers, • Compare the features of different types of printers, • Identify and name the audio output devices. 	12
5.	Identify and connect various storage devices	<ul style="list-style-type: none"> • Introduction to storage devices, • Different storage devices – HDD, Pen drive, memory cards, optical disk drive, • Types of HDD – IDE, SATA, SCSI, SSD, • Functionality, working and connectivity of HDD, • Functionality, working and connectivity of optical discs drive. 	<ul style="list-style-type: none"> • Identify the types and storage capacity of HDD, • Connect internal HDD to the computer, • Connect the external HDD to the computer, • Identify and name the optical discs drives, • Connect optical discs drives to computer. 	10
			Total Duration in Hours	50

Class XI, Unit 2: Installation and Configuration of Desktop Operating System				
Sn	Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	40 Hr s
6.	Describe the basic concept of operating system	<ul style="list-style-type: none"> • Overview of operating system, • Booting process of operating system, • Functions or tasks performed by the operating system, • Examples of operating system – Windows, Linux, Mac, • Types of operating system, • Classification of operating system – single user, multi-user, multitasking, multiprocessing, • Components of operating system – device driver, kernel, shell, file system 	<ul style="list-style-type: none"> • Observe the booting process, • Illustrate the functions of operating system, • List the features of various operating systems, • Identify and name the given operating system and its user interface, • Classify the given operating system as single user, multi-user, multitasking, multiprocessing, • Identify and list the various components of operating system. 	10
7.	Install Windows 10 operating system	<ul style="list-style-type: none"> • Windows 10 operating system requirements, • Features of Windows 10, • 32-bit and 64-bit versions of Windows 10, • Windows 10 upgrade or clean installation, • Configuration of boot order, • Clean installation process of Windows 10, • Post installation tasks, • Static IP address configuration in Windows10, • Installation of printer and scanner in Windows10, • Installation of antivirus software, device driver and application software. 	<ul style="list-style-type: none"> • Identify and list Windows 10 system requirements, • Identify 32-bit and 64-bit versions of Windows 10, • List the general features of Windows 10, • Demonstrate to configure correct boot order, • Demonstrate to install Windows 10 operating system, • Perform post installation tasks, • Demonstrate to turning off automatic installation of device driver, • Demonstrate to configure static IP address in Windows10, • Demonstrate to install printer and scanner in Windows10, • Demonstrate to install antivirus, device driver and application software in Windows10. 	15
8.	Install Ubuntu Linux operating system	<ul style="list-style-type: none"> • Introduction to Linux, • Features of Ubuntu Linux, • Installation Requirements, • Preparing the boot-able disk, • Installation process of Linux, • Post installation tasks, • Installation of packages and utilities, 	<ul style="list-style-type: none"> • List the features of Linux, • List the requirements for installation of Ubuntu Linux, • Demonstrate to prepare boot-able disk, • Demonstrate to install Linux, • Perform post installation tasks, • Demonstrate to install 	15

		<ul style="list-style-type: none"> • Static IP address configuration, • Installation of printers, scanner in Linux, • Basic commands of Linux. 	<ul style="list-style-type: none"> • packages and utilities, • Configure static IP address for internet connectivity, • Demonstrate to install printer and scanner in Linux. 	
			Total Duration in Hours	40

Class XI, Unit 3: Computer Maintenance and Troubleshooting

Sn	Learning Outcome	Theory (20 Hours)	Practical (40 Hours)	60 Hrs
1	Appreciate the customer complaint	<ul style="list-style-type: none"> • Concept of complaint, • Nature of complaint, • Types of complaint, • Various ways to make complaints – personal reporting, telephone, email, messaging, • Concept of customer support, • Registration / log of complaint, • Work flow to solve the complaint. 	<ul style="list-style-type: none"> • Identify and list the nature of complaint received, • Illustrate to use various ways to make complaints, • Identify and list the various customer support services, • Demonstrate the complaint ticket generation, • Draw the work flow diagram to solve the complaint. 	5
2	Identify the complaints on field	<ul style="list-style-type: none"> • Interacting with customer for understanding the nature before visit, • Field trip with tools and devices, • Understand the nature of problem on field by interacting with customer. 	<ul style="list-style-type: none"> • Role play to interact with customer to understand the nature of complaint before visit, • Perform field trip with tools and devices, • Role play to understand the problem on field by interacting with customer. 	5
3	Repair and replace faulty modules	<ul style="list-style-type: none"> • Procedures for warranty and non warranty part replacement, • Replacement and repair faulty module as per policy, • Computing cost of repairing, • Decision making in repair on site or at office, 	<ul style="list-style-type: none"> • List the products under warranty and non warranty, • Demonstrate to replace or repair the faulty modules, • Compute the cost of repairing, • Classify the given parts to repair on site and off site. 	6
4	Generate product repair report	<ul style="list-style-type: none"> • Generation of various report, • Terms and conditions of warranty, • Yearly maintenance contract, • Terms and conditions of maintenance contract, 	<ul style="list-style-type: none"> • Generate various reports such as fault report, repair report, report to the superior, invoice report, repairing cost report, complaint track report, • List the various terms and conditions of warranty, • Read the yearly maintenance contract, 	6

			<ul style="list-style-type: none"> • Read the terms and conditions of maintenance contract, • Prepare your own yearly maintenance contract based on service. 	
5	Use tools and equipment for repairing	<ul style="list-style-type: none"> • Tools and equipment for repairing – soldering iron, de-soldering pump, multi-meter, • Soldering and de-soldering on PCB • Cathode ray oscilloscope (CRO), • Analog and digital multi-meters, • Signal detection meters, power meters. 	<ul style="list-style-type: none"> • Identify, list and name tools and equipment for repairing, • Demonstrate the soldering and de-soldering on PCB, • Demonstrate to measure AC, DC voltages and current in the circuit using multi-meters, • Demonstrate to use CRO in signal observation, frequency and time period computation, • Demonstrate to use signal detection meters and power meters. 	8
6	Demonstrate the assembly and disassembly of computer	<ul style="list-style-type: none"> • Connectivity diagram of different parts of computer system, • Connectivity of internal parts of computer system, • Computer assembly process, • Computer dis-assembly process, • Laptop parts and peripherals and its compatibility with motherboard, • Connectivity of internal parts in laptop, • Laptop assembly process, • Laptop disassembly process. 	<ul style="list-style-type: none"> • Draw the connectivity diagram of various parts of computer, • Demonstrate to connect and assemble different parts of the computer as per the connectivity diagram, • Test the working of assembled computer system, • Demonstrate to connect the external parts and peripherals and check the functionality of computer, • Demonstrate to remove each part inside the computer, • Demonstrate to connect and assemble parts of laptop, • Test the assembled laptop. 	10
7	Identify, trace and resolve common hardware problems	<ul style="list-style-type: none"> • Portfolio of products, • Different types of hardware products and their functionalities, • Basic tools and devices for repair, • Procedures for hardware troubleshooting, • Procedures for hardware preventive maintenance, • Safety procedures, • Common hardware problems – device not working, device not getting boot, connectivity 	<ul style="list-style-type: none"> • Prepare portfolio of products, and its standards, • List the different types of hardware products and their functionalities, • Identify and list basic tools and devices for repair, • Enlist the procedures for hardware troubleshooting, • Enlist the procedures for hardware preventive maintenance, • Identify and list safety procedures, 	10

		problems, power supply failures, memory failure, printer not working, problem with cartridge of printer, printer not detected, peripherals not detected.	<ul style="list-style-type: none"> Identify and resolve the common hardware problems – power supply failures, device connectivity problems, memory failure, printer not working, cartridge of printer, peripherals not detected. 	
8	Identify, trace and resolve common software problems	<ul style="list-style-type: none"> Concept of boot-able disk, Preparation of boot-able disk, Procedure for troubleshooting operating system problem, Backup procedure of data, Common operating system problems, Problems related with device driver and antivirus software, Problems related with application software, Internet connectivity problem. 	<ul style="list-style-type: none"> Prepare boot-able disk, Enlist the procedure for troubleshooting operating system problem, Perform backup procedure, Identify and resolve the common problems related with operating system, Internet, problems related with device driver, antivirus software, application software. 	10
			Total Duration in Hours	60

Class XI, Unit 4: Occupational Health and Safety Practices

Sn	Learning Outcome	Theory (8 Hours)	Practical (7 Hours)	15 Hrs
9	Appreciate and follow the Computer Ergonomics	<ul style="list-style-type: none"> Concept of computer Ergonomics, Importance of cleanliness, Appropriate lighting conditions at workplace, Importance of air conditioning at workplace, Keeping food and drinks away from work place. 	<ul style="list-style-type: none"> Demonstrate the computer ergonomics at work place, List the possible threats to computing machine due to non-cleanliness, Demonstrate the impact of bad lighting conditions at computer work place, Record the working temperature of computing machine and observe the requirement of air condition, List the factors affecting life span of electronic machine, Practice to keep away food and drinks from work place. 	3
10	Observe electrical safety at work place	<ul style="list-style-type: none"> Proper electrical connections Wiring diagram of electrical connections, Concept of earthing, Measurement of input AC voltage, voltage between neutral and earthing, 	<ul style="list-style-type: none"> Observe and draw the wiring diagram of electrical connections, Measure input AC voltage, voltage between neutral and earth, and voltage between phase and earth, 	3

		<ul style="list-style-type: none"> • Electric shock and precautions to be taken, • Precautions in electrical short circuit, • Working practices for electrical devices. 	<ul style="list-style-type: none"> • List the precautions to be taken in case of electric shock and short circuit, • Practice to switch off electrical connections and devices before leaving work place. 	
1	Observe and practice organisation safety	<ul style="list-style-type: none"> • Concept of safety of work infrastructure, • Organisation safety rules, • Tools for safety, • Tools for fire safety, • Emergency procedures, • Emergency exit locations, • Precautions in case of smoke and smell, • Precautions for computer repair and cleaning. 	<ul style="list-style-type: none"> • Demonstrate to practice safety of work infrastructure, • List and use the tools for safety, fire safety, • List and follow emergency and emergency exit procedures, • Identify the exit locations, • List and follow precautions in case of smoke and smell, • List and follow precautions for computer repair and cleaning. 	3
1	Observe and practice self safety	<ul style="list-style-type: none"> • Self safety rules, • Importance of eye protection, • Importance of dress code, • Taking care of discharge of capacitors in electrical equipment, • Reasons to avoid jewellery at work place. 	<ul style="list-style-type: none"> • List and practice self safety rules, • Demonstrate to protect eyes, • Practice to switch off electrical devices to avoid effect of charged capacitors, • List impact of wearing jewellery at work place. 	3
1	Observe and practice safety of tools and equipment	<ul style="list-style-type: none"> • Safety manual of equipment, • Safety of tools and equipment, • Concept of Electrostatic Discharge (ESD), • Concept of anti-static mat and wrap. 	<ul style="list-style-type: none"> • Read safety manual of equipment, • Demonstrate the safety of tools and equipment, • Demonstrate to use anti-static mat and wrap. 	3
			Total Duration in Hours	15

CLASS 12

Part A	Employability, Skills Class 12	Duration in Hours
Unit 1	Communication Skills – IV	25
Unit 2	Self-management Skills – IV	25
Unit 3	Basic ICT Skills – IV	20
Unit 4	Entrepreneurial Skills – IV	25
Unit 5	Green Skills – IV	15
Part A	Vocational Skills, Class 12	110 Hours
Unit 1	Computer Network Essentials	30
Unit 2	Installation and configuration of Windows Server OS	30
Unit 3	Installation and configuration of Linux Server OS	30
Unit 4	IT Security	20
Unit 5	Computer Network Maintenance and Troubleshooting	40
Unit 6	Unit 6: Information Technology Infrastructure Library (ITIL) v4	15
		165 Hours

Class XII, Unit 1: Computer Network Essentials

Sn	Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	30 Hrs
1.	Describe the network concept and technology	<ul style="list-style-type: none"> • Concept of networking, • Network Technologies : peer to peer and Client/ Server, • Types of networking – LAN, MAN, WAN, • Network Topology – Bus, Star, Mesh, Hybrid, Ring, • Advantages and disadvantages of different topology, • OSI Model – 7 layer , • TCP/IP Model – 4 layer, • Data transmission – simplex, half duplex, full duplex. 	<ul style="list-style-type: none"> • Identify the given network technology as peer to peer or client server, • Draw a diagram of various network – LAN, MAN, WAN, • Draw a diagram of various network topology – Bus, Star, Mesh, Hybrid, Ring, • Draw a diagram of OSI, TCP/IP model, • Draw the diagram of simplex, half duplex and full duplex data flow. 	10
2.	Describe protocol and assign IP address	<ul style="list-style-type: none"> • Concept of protocol, • Protocol: TCP, IP, UDP, FTP, HTTP, HTTPS, • Assigning IP address (IPv4, IPv6) and subnet, • Inter-network (Internet, Intranet, Extra-net). 	<ul style="list-style-type: none"> • List the various protocol with its features, • Demonstrate to assign IP address and subnet, • Identify the given network as Internet, Intranet or Extra-net, 	5
3.	Connect and use network devices and peripherals	<ul style="list-style-type: none"> • Physical components : nodes/ computer/ hosts, Modem, RJ 45 connector and port, NIC, • Installation and configuration 	<ul style="list-style-type: none"> • Identify and name the given network component, • Identify and name the given network devices, 	8

		<ul style="list-style-type: none"> of NIC, Network devices – repeaters, hub, switch, bridges, router, gateway. 	<ul style="list-style-type: none"> Connect computers/ host to switch/hub, Assign IP address to host, Check connectivity using commands. 	
4.	Prepare cable and configure network	<ul style="list-style-type: none"> Network transmission medium – guided and, unguided, Guided – coaxial cable, twisted pair cable (UTP/ STP), optical fibre cable, Unguided – radio waves, infra red, wi-fi, li-fi, bluetooth, Crimping tools, punch down tool, LAN tester, Cable preparation – straight through, cross over cabling. 	<ul style="list-style-type: none"> Identify and list the various guided and unguided transmission media, Demonstrate to crimp the cable, Demonstrate to prepare straight through and cross over cable. Test cable using LAN tester. 	7
Total Duration in Hours				30

Class XII, Unit 2: Installation and Configuration of Network Operating System Windows Server

Sn	Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	30 Hrs
5.	Install Windows Server 2016	<ul style="list-style-type: none"> Windows Server 2016 Overview, Hardware requirements for Windows server installation Installation procedure of Windows Server 2016, Post-Installation configuration of Windows Server 2016. 	<ul style="list-style-type: none"> List the hardware requirements for Windows server installation, Create partitioning, Demonstrate to install Windows Server 2016, Demonstrate to configure Windows Server 2016 Server, Demonstrate to perform post-installation tasks in Windows Server 2016, Demonstrate to deploy Windows Server 2016, 	5
6.	Manage Windows Server 2016	<ul style="list-style-type: none"> Overview of Windows Server 2016 Management, Management tools available in Windows Server 2016, Introduction to Windows PowerShell. 	<ul style="list-style-type: none"> Managing Servers Using Windows PowerShell to Manage Servers, Perform basic administrative tasks using Windows PowerShell. 	5
7.	Install and configure Active Directory Domain Services (AD DS)	<ul style="list-style-type: none"> Overview of AD DS Overview of Domain Controllers Purpose of domain controllers Structure of AD DS, Installing a domain controller. 	<ul style="list-style-type: none"> Demonstrate to configure AD DS Demonstrate to install Domain Controller. 	7
8.	Implement AD DS	<ul style="list-style-type: none"> Managing user accounts, 	<ul style="list-style-type: none"> Demonstrate to create and 	8

	and manage group policy	<ul style="list-style-type: none"> Managing groups, Overview of group policy, Group policy processing, Creating Group Policy Objects (GPOs). 	configuring User Accounts in AD DS <ul style="list-style-type: none"> Demonstrate to manage user accounts through GUI, Demonstrate to manage group accounts user accounts through GUI, Demonstrate to create and manage GPOs. 	
9.	Install antivirus and print services	<ul style="list-style-type: none"> Installation and configuration of antivirus software and application software for server, Installation and configuration of print services. 	<ul style="list-style-type: none"> Demonstrate to install antivirus and application software, Installation of print services role, and configure print services. 	5
Total Duration in Hours				30

Class XII, Unit 3: Installation and Configuration of Network Operating System Linux Server				
Sn	Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	30 Hr s
10.	Install Linux Server	<ul style="list-style-type: none"> Linux server overview, Partitioning, Dual booting, Installation process of Linux server, Post-Installation configuration of Linux server. 	<ul style="list-style-type: none"> Demonstrate to create partitioning, dual booting, Demonstrate to install Linux server, Demonstrate to configuring Linux server, Perform post-installation configuration of Linux server. 	6
11.	Understand the file structure of Linux	<ul style="list-style-type: none"> Overview of Linux file structure, Linux users – superuser, group user and others, User permissions – read, write, execute, Common commands for system administration. 	<ul style="list-style-type: none"> Draw the diagram of Linux file structure, List the various system directory, Create user and group, Change user and group permissions, Perform the basic system administration using command 	6
12.	Manage Linux server	<ul style="list-style-type: none"> Overview of Linux server management, Introduction to Linux terminal, Linux server management commands, DHCP configuration. 	<ul style="list-style-type: none"> Login as a superuser, List the common administrative tasks, Use Linux commands for basic administration. 	7
13.	Install and remove packages for services	<ul style="list-style-type: none"> Overview of various services, Commands for installing packages for various services, 	<ul style="list-style-type: none"> List the various services and its commands, Demonstrate to install 	7

		<ul style="list-style-type: none"> • Commands for removing packages for various services, • Commands for updating packages. 	<ul style="list-style-type: none"> • packages for various services, • Demonstrate to remove packages using commands, • Demonstrate to update packages using commands. 	
14.	Install and configure print services and file sharing services	<ul style="list-style-type: none"> • Concept of print services and file sharing services, • Commands for installing print services and file sharing services, 	<ul style="list-style-type: none"> • List the print services and file sharing services, • Install print services and file sharing services by using commands, 	4
Total Duration in Hours				30

Class XII, Unit 4: Computer Network Maintenance and Troubleshooting				
Sn	Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	40 Hrs
1	Identify, trace and resolve common network problems	<ul style="list-style-type: none"> • Problems related with <ul style="list-style-type: none"> – power failure problems, – wiring problems in network, – problems of devices not working in the network, – related with the non availability of common network services, – problems of Internet not working, – server connectivity problems, – network hang problems, – issues related to downloading and uploading speed of Internet and network. 	<ul style="list-style-type: none"> • Identify, trace and resolve the problems <ul style="list-style-type: none"> – power failure problems, – wiring problems in network, – problems of devices not working in the network, – related with the non availability of common network services, – problems of Internet not working, – server connectivity problems, – network hang problems, – issues related to downloading and uploading speed of Internet and network. 	12
1	Identify, trace and resolve problems related with hardware devices	<ul style="list-style-type: none"> • Problems related with <ul style="list-style-type: none"> – physical connectivity of hardware devices, – setting and configuration of hardware devices, – replacement of old non functional devices, – maintenance of devices. 	<ul style="list-style-type: none"> • Identify, trace and resolve the problems related with <ul style="list-style-type: none"> – physical connectivity of hardware devices, – setting and configuration of hardware device, – replacement of old non functional devices, – maintenance of devices. 	10
1	Identify, trace and resolve problems related with network OS	<ul style="list-style-type: none"> • Problems related with <ul style="list-style-type: none"> – installation of software, – setting and configuration of software, – maintenance and updataion of software, – replacement and re-installation of software. 	<ul style="list-style-type: none"> • Identify, trace and resolve problems related with <ul style="list-style-type: none"> – installation of software, – setting and configuration of software, – maintenance and updataion of software, – replacement and re-installation 	8

			of software.	
	Identify, trace and resolve problems related to network user	<ul style="list-style-type: none"> • Authentication problem, • Problems related to login and password issues, • Addition and deletion of users, • User rights and permission policy, • Permission to access network resources. 	<ul style="list-style-type: none"> • Identify, trace and resolve authentication problem, problems related to login and password, • Add, delete users, groups and their permissions to access network resources hardware, software and data. 	10
Total Duration in Hours				40

Class XII, Unit 5: IT Security

Sn	Learning Outcome	Theory (10 Hours)	Practical (10 Hours)	20 Hr s
15.	Appreciate IT Security Concepts	<ul style="list-style-type: none"> • Concept of security, • IT security, • Data Threats – Virus, malware, Trojan, worm, • Denial of service (DoS) attacks, phishing attacks, man-in-the-middle, • File Security. 	<ul style="list-style-type: none"> • List different types of threats in computer system, • List the Characteristics of Phishing mail and websites, • Recognise malicious, accidental threats to data from individuals, service providers, other organisation, • Demonstrate to set the security level – Low, Medium or High. 	4
16.	Manage file security using antivirus software	<ul style="list-style-type: none"> • Antivirus • Procedure for installation, configuration and updation of antivirus software, • Automatic and manual update procedure of antivirus, • Settings of antivirus software. • Detection removal of viruses by using antivirus software, • File security using antivirus. 	<ul style="list-style-type: none"> • List the antivirus software, • Install the antivirus software in the given system, • Demonstrate to run antivirus software for detection removal of viruses, • Update the antivirus software automatically and manually, • Check and change settings of antivirus software. 	4
17.	Manage Internet security	<ul style="list-style-type: none"> • Concept of Internet security, • Software for Internet security, • Installation, configuration and updation of software for Internet security, • Uses of Internet security software. 	<ul style="list-style-type: none"> • List the threats to the Internet, • List Internet security software, • Demonstrate to install, configure and update software for Internet security, • Demonstrate the use of Internet security software. 	4
18.	Describe the concept of hacking	<ul style="list-style-type: none"> • Overview on hacking, • Types of hackers, • Ethical hacking, • Cyber crime. 	<ul style="list-style-type: none"> • List the various types of hackers – white, gray, black, • List the various techniques for ethical hacking, 	4

			<ul style="list-style-type: none"> Prepare a chart of different cyber crime activities. 	
19.	Implement security policy using firewalls	<ul style="list-style-type: none"> Security policy, Firewall, Types of firewall – software and hardware, Functioning of firewall at different layers (Packet filter, Stateful, Application), 	<ul style="list-style-type: none"> Draw a diagram of firewall, List different types of firewall, Checking firewall is enabled or disabled in PC, Demonstrate to restrict sites using firewall. 	4
Total Duration in Hours				20

Class XII, Unit 6: Information Technology Infrastructure Library (ITIL) v4				
Sn	Learning Outcome	Theory (10 Hours)	Practical (5 Hours)	15 Hr s
1	Appreciate the need and importance of best practices in IT service sector	<ul style="list-style-type: none"> Problems in IT service sector, Problems related to the customer queries, acquisition of knowledge, demand for new technology, Examples of best practices in IT service sector. 	<ul style="list-style-type: none"> Identify and list the problems in IT service sector, Identify and list the problems related to the customer queries, acquisition of knowledge, demand for new technology, Give the examples of best practices in IT service sector. 	2
1	Appreciate the concept and method of monitoring in IT service sector	<ul style="list-style-type: none"> Concept and importance of monitoring IT service, Method for monitoring, Examples of monitoring, Possible problems and solutions in IT service monitoring. 	<ul style="list-style-type: none"> List out the importance of monitoring IT service, Give the steps for monitoring, List the possible problems and solutions for monitoring of given IT service, Give the examples of best monitoring methods, 	2
2	Measure the IT service parameters by using tools	<ul style="list-style-type: none"> IT quality service parameters – competence, courtesy, credibility, access, communication, reliability, responsiveness, Process to measure IT service parameters, Tools for measuring IT service parameters, Process to report measurement of IT service parameters, Examples of measurement of IT service parameters, 	<ul style="list-style-type: none"> List the IT quality service parameters, Draw the diagram of measuring process of IT service parameters, Identify and list the tools for measuring IT service parameters, Draw the diagram of reporting procedure of IT service parameters. 	3
2	Describe the	<ul style="list-style-type: none"> Concept of critical success 	<ul style="list-style-type: none"> Determine the critical success 	2

	concepts of CSF, KPI, SLA	<p>factor (CSF),</p> <ul style="list-style-type: none"> • Concept of key performance indicators (KPI), • Concept of service level agreement (SLA), • Importance of CSF, KPI and SLA • Prototype examples of CSF, KPI, SLA. 	<p>factor (CSF) in the given service,</p> <ul style="list-style-type: none"> • List the KPI (key performance indicators) in the given service, • List different clauses in service level agreement (SLA), • Give best examples of CSF, KPI, SLA. 	
2	Appreciate the importance of timeliness and response to the customer queries	<ul style="list-style-type: none"> • Concept and importance of timeliness, • Methods of responding to the customer, • Importance of data resolution in cloud services, • Examples of timeliness and its impact on service, • Examples of responses. 	<ul style="list-style-type: none"> • List the parameters of timeliness, • Give the methods of responding to the customer, • List the importance of data resolution, • Give best examples of timeliness and responses. 	2
2	Describe the problem management process flow and determine resolutions	<ul style="list-style-type: none"> • Concept of problem management, • Concept of control measures, • Problem management process flow, • Process to find solutions for given problem using control measures • Determining resolutions, • Examples of problem management. 	<ul style="list-style-type: none"> • List the necessity of problem management, • List the necessity of control measures, • Draw the diagram of problem management process flow, • Draw the process diagram to find solutions for given problem using control measures, • Determine resolutions for given problem, • Give the best examples of problem management. 	2
2	Describe the importance of learning new things and implement them at your work	<ul style="list-style-type: none"> • Limitations of existing knowledge, tools and techniques, • Demand for new technology, • Learning through experiences, • Implementation of newly learnt knowledge, • Examples of implementation of newly learnt knowledge. 	<ul style="list-style-type: none"> • List the limitations of existing knowledge, tools and techniques, • Illustrate the demand for new technology, • Illustrate how new things are learnt from past experiences, • Demonstrate how to implement newly learnt knowledge. 	2
			Total Duration in Hours	15