



Republic of the Philippines

# Department of Education

DepEd Complex, Meralco Avenue, Pasig City

**STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM**  
**COMPUTER SYSTEMS SERVICING**  
**Grade 11/12**

**Course Description:**

This course equips learners with competencies in setting up, configuring, and maintaining computer systems, networks, and servers. It also fosters problem-solving skills and promotes efficient practices in IT service management. Learners will also explore business and service opportunities in the IT industry, preparing them for roles in entrepreneurship, freelancing, and managed IT services. Upon completion, learners are eligible to take assessments to earn National Certificate Level II in Computer System Servicing, higher education, and careers in the electronics industry.

**Elective:** Technical Professional

**Prerequisite:** None

**Time Allotment:** In Grade 11, 320 hours for two semesters, 8 hours per week/In Grade 12, 320 hours for one semester, 16 hours per week

**Schedule:** First/Second Semester

**QUARTER 1**

<b>CONTENT STANDARD</b>	The learners demonstrate an understanding of concepts and principles in setting up computer systems.	
<b>PERFORMANCE STANDARD</b>	The learners perform setting up computer systems, adhering to occupational health and safety standards.	
<b>LEARNING COMPETENCIES</b>		<b>CONTENT</b>
1. Discuss fundamental concepts of computer systems servicing		Fundamental Concepts in Computer Systems Servicing <ul style="list-style-type: none"> <li>• Trends in computer system servicing</li> <li>• Tools, equipment, and materials</li> <li>• OHS standards and 5S/8S principles</li> </ul> Career and Business Opportunities in Computer Systems Servicing <ul style="list-style-type: none"> <li>• Career opportunities</li> <li>• Business opportunities</li> </ul>

	<ul style="list-style-type: none"> <li>○ services costing and consulting</li> <li>○ computer repair shop</li> <li>○ repair services</li> <li>○ computer accessories and parts retail</li> </ul>
2. Discuss elements of computer systems	<p>Computer System Elements</p> <ul style="list-style-type: none"> <li>• Types and parts of a computer</li> <li>• System unit parts and its functions</li> <li>• System software <ul style="list-style-type: none"> <li>○ operating system</li> <li>○ device drivers</li> <li>○ utility software</li> <li>○ firmware</li> <li>○ boot loaders</li> <li>○ file management system</li> </ul> </li> <li>• Application Software <ul style="list-style-type: none"> <li>○ productivity software</li> <li>○ database software</li> <li>○ multimedia software</li> <li>○ web browsers</li> </ul> </li> <li>• Peopleware</li> <li>• Procedure/Dataware</li> </ul>
3. Perform disassembly and assembly of computer hardware	Computer Disassembly and Assembly procedure
4. Create portable bootable device	<p>Preparing Application and System Software</p> <ul style="list-style-type: none"> <li>• Create ISO image file</li> </ul> <p>Creating Bootable Device</p> <ul style="list-style-type: none"> <li>• Use third party application</li> </ul> <p>Use DOS command</p>
5. Perform installation of system software and application software	<p>Installation of Operating System and Application Software</p> <ul style="list-style-type: none"> <li>• BIOS/UEFI configuration</li> <li>• Install operating system</li> <li>• Disk management</li> </ul>

	<ul style="list-style-type: none"> <li>• Device drivers</li> <li>• Install system drivers</li> <li>• Install application software</li> </ul>
6. Perform computer testing and documentation	Computer Testing and Documentation <ul style="list-style-type: none"> <li>• Stress Test / Burning Test</li> <li>• Reporting and documentation process</li> </ul>

### QUARTER 2

<b>CONTENT STANDARD</b>	The learners demonstrate an understanding of the principles of setting up a computer network.
<b>PERFORMANCE STANDARD</b>	The learners perform installation, configuration and testing of computer networks, adhering to occupational health and safety standards
<b>LEARNING COMPETENCIES</b>	<b>CONTENT</b>
1. Discuss the concepts of computer network	Computer Network Concepts <ul style="list-style-type: none"> <li>• Types of networks             <ul style="list-style-type: none"> <li>○ topology</li> <li>○ advantages and disadvantages of network topology</li> <li>○ peer to peer and client server</li> </ul> </li> <li>• Network architecture</li> <li>• IP addressing</li> <li>• IPV4 vs IPV6</li> <li>• Network devices</li> </ul>

2. Perform setting up of computer network	Setting Up Computer Network <ul style="list-style-type: none"> <li>• Network mapping</li> <li>• Types of cables</li> <li>• Terminating and testing an ethernet cable</li> <li>• Cable installation</li> <li>• Cable Management (network rack/server cabinet)</li> <li>• Router/Access Point/Repeater configuration</li> <li>• Managed/Unmanaged switch</li> </ul>
3. Perform network testing and documentation	Network Testing and Documentation <ul style="list-style-type: none"> <li>• Connectivity test</li> <li>• Reporting and documentation process</li> </ul>

### QUARTER 3

<b>CONTENT STANDARD</b>	The learners demonstrate an understanding of principles in setting up computer servers.	
<b>PERFORMANCE STANDARD</b>	The learners perform setting up of a computer server.	
<b>LEARNING COMPETENCIES</b>		<b>CONTENT</b>
1. Discuss the concepts of server management	Server Management <ul style="list-style-type: none"> <li>• Types and functions</li> <li>• Relationship</li> <li>• Network Operating Systems (NOS)</li> </ul>	

<p>2. Perform server installation</p>	<p>Server Installation</p> <ul style="list-style-type: none"> <li>• Network Operating System installation</li> <li>• Server Manager <ul style="list-style-type: none"> <li>○ interface, features, and roles</li> <li>○ overview of basic server roles</li> <li>○ initial configurations</li> </ul> </li> </ul>
<p>3. Perform installation of Active Directory Domain Services (ADDS)</p>	<p>Active Directory Domain Services (ADDS)</p> <ul style="list-style-type: none"> <li>• Key concepts <ul style="list-style-type: none"> <li>○ objects and attributes</li> <li>○ organizational units</li> </ul> </li> <li>• Installation <ul style="list-style-type: none"> <li>○ create Organizational Unit (OU)</li> <li>○ create user accounts</li> <li>○ create groups</li> </ul> </li> </ul>
<p>4. Perform installation of Domain Name System (DNS) services</p>	<p>Domain Name System (DNS) Services</p> <ul style="list-style-type: none"> <li>• Domain Name System (DNS) key concepts</li> <li>• Install DNS services <ul style="list-style-type: none"> <li>○ forward and reverse lookup zones</li> </ul> </li> </ul>
<p>5. Perform installation and configuration of Dynamic Host Configuration Protocol (DHCP) services</p>	<p>Dynamic Host Configuration Protocol (DHCP) Services</p> <ul style="list-style-type: none"> <li>• Key concepts</li> <li>• Installation procedures</li> <li>• Configuration <ul style="list-style-type: none"> <li>○ scope</li> <li>○ IP address range</li> <li>○ subnet Mmask</li> <li>○ exclusions</li> <li>○ lease duration</li> </ul> </li> </ul>
<p>6. Perform installation and configuration of File and Storage Services</p>	<p>File and Storage Services</p> <ul style="list-style-type: none"> <li>• Key concepts</li> </ul>

	<ul style="list-style-type: none"> <li>• File Server Resource Manager</li> <li>• Installation procedures</li> <li>• Configuration <ul style="list-style-type: none"> <li>○ folder redirection</li> <li>○ network drive map</li> </ul> </li> </ul>
7. Perform installation and configuration of web servers Internet Information Services (IIS).	Web Servers Internet Information Services (IIS) <ul style="list-style-type: none"> <li>• Basic architecture</li> <li>• Core components</li> <li>• Key features</li> <li>• Installation</li> </ul>
8. Perform installation of print and document services	Print and Document Services <ul style="list-style-type: none"> <li>• Printer deployment</li> </ul>
9. Perform installation of remote desktop services	Remote Desktop Services <ul style="list-style-type: none"> <li>• Installation procedures</li> <li>• Types <ul style="list-style-type: none"> <li>○ remote desktop session host</li> <li>○ remote desktop web access</li> <li>○ remote desktop gateway</li> </ul> </li> </ul>

#### QUARTER 4

<b>CONTENT STANDARD</b>	The learners demonstrate an understanding of the principles of troubleshooting, repairing and maintaining computer systems, network and servers
<b>PERFORMANCE STANDARD</b>	The learners perform the process of troubleshooting, repairing and maintaining computer systems, networks and servers.
<b>LEARNING COMPETENCIES</b>	<b>CONTENT</b>
1. Perform troubleshooting and repairs of computer systems	Troubleshooting & Repairing Computer Systems <ul style="list-style-type: none"> <li>• Compatibility issues: hardware vs software</li> <li>• Display problems</li> </ul>

	<ul style="list-style-type: none"> <li>• Power supply issues</li> <li>• Overheating</li> <li>• Low performance</li> <li>• Hard drive issues</li> </ul> <p>Troubleshooting &amp; Repairing Laptops</p> <ul style="list-style-type: none"> <li>• LCD/LED replacement</li> <li>• Keyboard replacement</li> <li>• Hard drive replacement/upgrade (cloning)</li> <li>• RAM replacement/upgrade</li> <li>• Battery replacement</li> <li>• Software problems: <ul style="list-style-type: none"> <li>○ operating systems</li> <li>○ drivers</li> <li>○ applications</li> <li>○ viruses and malwares</li> </ul> </li> </ul>
2. Perform troubleshooting and repairs of computer network	<p>Computer Network Troubleshooting and Repair</p> <ul style="list-style-type: none"> <li>• Network problems <ul style="list-style-type: none"> <li>○ no internet connection</li> <li>○ slow internet connection</li> <li>○ wifi problems</li> </ul> </li> <li>• Network connectivity checking procedures and techniques <ul style="list-style-type: none"> <li>○ Ping</li> <li>○ Netstat</li> <li>○ IP Config</li> <li>○ Traceroute</li> <li>○ NSlookup</li> </ul> </li> </ul>
3. Perform troubleshooting and repairs of computer server	<p>Computer Server Troubleshooting and Repair</p> <ul style="list-style-type: none"> <li>• Network outages</li> </ul>

	<ul style="list-style-type: none"> <li>• DNS issues</li> <li>• High network traffic</li> <li>• NOS errors</li> <li>• Application errors</li> <li>• Security vulnerabilities</li> </ul>
<p>4. Perform maintenance of computer systems</p>	<p>Computer Systems Maintenance</p> <ul style="list-style-type: none"> <li>• Hardware maintenance <ul style="list-style-type: none"> <li>○ cleaning</li> <li>○ physical checks</li> <li>○ upgrade</li> </ul> </li> <li>• Software maintenance <ul style="list-style-type: none"> <li>○ operating system updates</li> <li>○ software updates</li> <li>○ uninstall unused program</li> </ul> </li> <li>• Data maintenance <ul style="list-style-type: none"> <li>○ backups</li> <li>○ disk cleanup</li> <li>○ defragmentation</li> <li>○ check disk</li> </ul> </li> <li>• Security maintenance <ul style="list-style-type: none"> <li>○ antivirus update</li> <li>○ password update</li> </ul> </li> <li>• Performance maintenance <ul style="list-style-type: none"> <li>○ startup programs</li> <li>○ resource monitoring</li> <li>○ system optimization</li> </ul> </li> </ul>
<p>5. Perform maintenance of computer networks</p>	<p>Computer Network Maintenance</p> <ul style="list-style-type: none"> <li>• Monitoring network performance <ul style="list-style-type: none"> <li>○ continuous monitoring</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ performance analysis</li> <li>○ optimization</li> <li>● Maintaining network hardware <ul style="list-style-type: none"> <li>○ regular inspection</li> <li>○ cleaning and upkeep</li> <li>○ firmware updates</li> <li>○ hardware upgrades</li> </ul> </li> <li>● Managing network software</li> <li>● Ensuring network security</li> </ul>
6. Perform maintenance of computer servers	<p>Maintaining Computer Server</p> <ul style="list-style-type: none"> <li>● Monitoring server performance</li> <li>● Maintaining server hardware</li> <li>● Updating server software</li> <li>● Managing server security</li> <li>● Backing up server data</li> <li>● Optimizing server performance</li> </ul>
7. Prepare documentation and reporting on maintenance of computer systems, servers, and networks.	<p>Documentation and Reporting</p> <ul style="list-style-type: none"> <li>● Job service order forms or checklist</li> <li>● Types of job order/service</li> </ul>
8. Develop a business plan proposal	<p>Proposing a Business Plan</p> <ul style="list-style-type: none"> <li>● Market analysis</li> <li>● SWOT analysis</li> <li>● Feasibility</li> </ul>

## GLOSSARY

**access point:** a device that allows wireless devices to connect to a wired network, expanding the network's reach

**application software:** programs designed for end users to perform specific tasks, such as word processing or data management

**backups:** copies of data stored separately to prevent loss in case of hardware failure or other issues

**cable management:** the practice of organizing and maintaining cables within a network, often using racks or cabinets to ensure safety and efficiency

**cloning:** the process of creating an exact copy of a hard drive or other storage device for backup or migration purposes

**computer network:** a collection of interconnected computers that can share resources and communicate with one another

**connectivity test:** a procedure used to determine if devices on a network can successfully communicate with each other

**defragmentation:** the process of reorganizing fragmented data on a hard drive to improve performance and access speed

**documentation:** the process of creating and maintaining records about network configurations, devices, and changes, which is essential for troubleshooting and management

**DNS (Domain Name System):** a system that translates human-friendly domain names into ip addresses that computers use to identify each other on the network

**firmware:** software that is permanently programmed into hardware devices, providing low-level control for the device's specific hardware

**hardware:** the physical components of a computer system, such as the monitor, keyboard, and internal parts like the cpu and motherboard.

**malware:** malicious software designed to harm, exploit, or otherwise compromise a computer system

**network architecture:** the design and structure of a network, including its physical and logical layout, which determines how devices communicate with each other

**network connectivity:** the ability of a computer or device to connect to a network and communicate with other devices

**network traffic:** the amount of data being transmitted over a network at any given time, which can affect performance and speed

**optimization:** the process of making a system or component as effective and functional as possible

**operating system:** the primary software that manages computer hardware and software resources, providing a user interface and controlling system functions

**overheating:** a condition where a computer's internal temperature rises to a level that can cause damage to components

**reporting process:** the systematic method of documenting and communicating findings from network tests or assessments

**resource monitoring:** the process of tracking and managing the usage of a computer's resources, such as cpu, memory, and storage

**system unit:** the main body of a computer, housing critical components like the motherboard, cpu, and power supply

**terminating:** the process of preparing the end of a network cable to ensure proper connectivity and signal transmission

**unmanaged switch:** a basic network switch that operates without configuration, allowing devices to connect easily but lacks advanced management features

## REFERENCES

Technical Education and Skills Development Authority (TESDA). Training regulations (TR): Computer system servicing NC II.

Technical Education and Skills Development Authority (TESDA). (n.d.). TESDA Online Program: Computer system servicing NC II. <https://e-tesda.gov.ph/course/index.php?categoryid=16>

### MATERIALS, TOOLS, AND EQUIPMENT

TOOLS	EQUIPMENT	MATERIALS
Screwdriver (standard)	Desktop Computer	Reference Book
Screwdriver (Philips)	Laptop computer/Netbook	Adobe PDF documents
Long nose pliers	Computers for server	Hand-outs
Mechanical pliers	Server cabinet/Frame	CD's CD ROMs DVDs
Allen wrench	Patch panel (48-ports)	Practice materials
Crimping tools	Working tables	Print media
Soldering iron	Internet subscription (at least 2 MBPS)	Various printing media (e.g. photo-paper, tarpaulin, etc.) Printed materials
Solder sucker	Uninterruptible Power Supply (UPS)	Printed materials
Wire stripper	Hub / Switch	Books and magazines Newspapers Brochures and flyers Billboards and tarpaulins

Portable electric hand drill	Managed switch	<ul style="list-style-type: none"> <li>-Prototype materials</li> <li>papers/cardboards</li> <li>- plastic</li> <li>- textiles</li> <li>- styrofoam</li> <li>- actual product being sold</li> <li>- corrugated boxes</li> <li>- wood</li> <li>- ceramics</li> <li>- tarpaulin</li> <li>- electrical gadgets</li> <li>- neon lights</li> <li>- digital displays</li> <li>- metallic materials</li> <li>- actual product being displayed</li> <li>- mannequins</li> <li>- organic materials</li> </ul>
Drill bit	Managed switch	RJ 45
Precision screw drivers	ADSL Router with Wi-Fi	Modular box (RJ45)
Anti-static devices	Wireless Access Point	Modular box (RJ45)
Flash light/Head mounted light	PC Video camera	UTP cable
	External optical drive	Contact cleaner
	USB External HD	Whiteboard
	Network External HD	Fastener
	scanner	Filler (lead-free)

	USB printer	Fiber optic cable 2 meters (terminated)
	Network printer	Desktop OS (license for proprietary software)
	Flash disk / Memory stick	Network OS (license for proprietary software)
	Electronic tester VOM	Office productivity software (license for proprietary software)
	LAN Cable tester	Anti-virus (license for proprietary software)
		Disk utility software
		Virtualization software (license for proprietary software)
		Disk creator software
		Disk image software
		Motherboard's manual and installer
		Device driver installer
		Assorted Computer book, PC Magazines and journals