



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

ELECTRONICS PRODUCT ASSEMBLY AND SERVICING

Grade 11/12

Course Description:

This course equips learners with essential skills for Electronic Systems Servicing, focusing on consumer and industrial electronic products and systems. It covers assembling and servicing in compliance with industry standards. Upon completion, learners are eligible to take assessments to earn National Certificate level II in Electronic Product Assembly and Servicing, higher education, and careers in the electronics sector 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

CONTENT STANDARD	The learners demonstrate understanding of the principles in electronic systems assembling and servicing, identification of electronic components, PCB designing, soldering and desoldering, and assembly of electronic products.	
PERFORMANCE STANDARD	The learners perform procedures in assembling and testing of electronic components, and power supply assembly following existing standard.	
LEARNING COMPETENCIES	CONTENT	
1. Explain the overview of Electronic Systems Servicing	Overview of Electronic Systems Servicing <ul style="list-style-type: none"> • Introduction to Electronic Systems Servicing • Emerging trends in the field • Career and business opportunities 	
2. Discuss electronic components identification	Electronic Components <ul style="list-style-type: none"> • Types of electronic components • Datasheets 	
3. Demonstrate procedures in testing electronic components.	Testing procedures <ul style="list-style-type: none"> • Passive components • Active components 	
4. Discuss the procedures for PCB designing, including design software and layout transfer techniques	Printed Circuit Boards (PCB) <ul style="list-style-type: none"> • Types and Application 	

	<ul style="list-style-type: none"> • Fabrication Procedures <ul style="list-style-type: none"> ○ PCB design software ○ Layout transfer methods ○ PCB etching methods
5. Discuss soldering and desoldering	<p>Soldering</p> <ul style="list-style-type: none"> • Soldering workstation • Hot air soldering • Reflow oven • Dip soldering <p>Desoldering</p> <ul style="list-style-type: none"> • Desoldering pump • Solder wick (Desoldering braid) • Hot air rework station
6. Discuss the different types of power supplies	<p>Power Supply</p> <ul style="list-style-type: none"> • Regulated and Unregulated • Fixed and Variable
7. Perform variable regulated power supply assembly	<p>Variable Regulated Power Supply Assembly</p> <ul style="list-style-type: none"> • PCB design and implementation • Assembly • Inspection and Testing

QUARTER 2

CONTENT STANDARD	The learners demonstrate an understanding of the principles of appliances with electric motors, appliances with heating components, and electronic controlled lighting units.
PERFORMANCE STANDARD	The learners perform servicing of appliances with electric motors, appliances with heating elements, and rechargeable and electronic-controlled lighting units ensuring adherence to safety standards.
LEARNING COMPETENCIES	CONTENT

<ol style="list-style-type: none"> Discuss the procedures in servicing appliances with electric motors Apply procedures in servicing appliances with electric motors 	Appliances with Electric Motor <ul style="list-style-type: none"> Principles of electric motors Common appliances Common defects and corrective actions Troubleshooting, Repairing, Testing, and Maintaining Documentation and Service Costing
<ol style="list-style-type: none"> Discuss the procedures in servicing appliances with heating components Apply procedure in servicing appliances with heating components 	Appliances with Heating Components <ul style="list-style-type: none"> Principle of heating components Common appliances Common defects and corrective actions Troubleshooting, Repairing, Testing, and Maintaining Documentation and Service Costing
<ol style="list-style-type: none"> Discuss the procedures in servicing rechargeable and electronic-controlled lighting units. Demonstrate the procedure in servicing electronic-controlled lighting units 	Rechargeable and Electronic-Controlled Lighting Units <ul style="list-style-type: none"> Parts & Types Common appliances Common defects and corrective actions Troubleshooting, Repair, Testing, and Maintenance Documentation and Service Costing

QUARTER 3

CONTENT STANDARD	The learners demonstrate an understanding of the principles of Closed-Circuit Television (CCTV) systems, and fire alarm systems.
PERFORMANCE STANDARD	The learners perform servicing of Closed-Circuit Television (CCTV) systems, and fire alarm systems ensuring adherence to safety precautions.
LEARNING COMPETENCIES	CONTENT
<ol style="list-style-type: none"> Discuss the principles of Closed-Circuit Television (CCTV) system 	Closed-Circuit television (CCTV) System <ul style="list-style-type: none"> Principles of CCTV system Types Parts

	<ul style="list-style-type: none"> ○ Recorders ○ Storage ○ Camera ● Layout
2. Demonstrate the procedure in CCTV system installation	<p>Closed-Circuit Television (CCTV) Installation Procedure</p> <ul style="list-style-type: none"> ● Indoor ● Outdoor
3. Perform CCTV system servicing	<p>Closed-Circuit Television (CCTV) System Servicing</p> <ul style="list-style-type: none"> ● Common defects and corrective actions ● Troubleshooting, Repairing, Testing, and Maintaining ● Documentation and Service Costing
4. Discuss the principles of fire alarm systems	<p>Fire Alarm system</p> <ul style="list-style-type: none"> ● Principles of Fire Alarm System ● Types ● Parts <ul style="list-style-type: none"> ○ Control panel ○ Alarm initiating devices ○ Notification systems ○ Power supply
5. Perform the procedure in fire alarm system installation	<p>Fire Alarm System</p> <ul style="list-style-type: none"> ● Layout ● Installation ● Testing
6. Perform the procedure in fire alarm system servicing	<p>Fire Alarm System Servicing</p> <ul style="list-style-type: none"> ● Common defects and corrective actions ● Troubleshooting, Repairing, Testing, and Maintaining ● Documentation and Service Costing

QUARTER 4

CONTENT STANDARD	The learners demonstrate an understanding of the principles of audio products and systems, television, control boards and motor controllers, sensors and actuators.
PERFORMANCE STANDARD	The learners perform procedures in servicing audio products and systems, control boards and motor controllers, and sensors and actuators ensuring adherence to safety precautions.
LEARNING COMPETENCIES	CONTENT
1. Discuss audio products and systems	Audio Products and Systems <ul style="list-style-type: none"> • Radio receivers • Audio recorders • Intercom systems • Public address systems
2. Perform the installation and operation of audio products and systems	Audio Products and Systems Installation/Operation
3. Perform procedure in servicing audio products and systems	Audio Products and Systems Servicing <ul style="list-style-type: none"> • Common defects and corrective actions • Troubleshooting, Repairing, Testing, and Maintaining • Documentation and Service Costing
4. Discuss television 5. Perform the procedure in servicing television	Television <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ LED ○ Plasma ○ LCD ○ CRT • Parts <ul style="list-style-type: none"> ○ Power Management System ○ Display System ○ Audio System ○ Input/Output & Connectivity System ○ Processing and Control System Television Servicing Procedure

	<ul style="list-style-type: none"> • Common defects and corrective actions • Troubleshooting, Repairing, Testing, and Maintaining • Documentation and Service Costing
<p>6. Discuss control boards and motor controllers</p> <p>7. Perform the procedure in servicing control boards and motor controllers</p>	<p>Control Boards</p> <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Microcontrollers ○ Single Board Computers (SBCs) ○ Digital Signal Processing (DSP) Boards <p>Motor controllers</p> <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Stepper ○ Servo ○ Brushless <p>Servicing Procedure</p> <ul style="list-style-type: none"> • Common defects and corrective actions • Troubleshooting, Repairing, Testing, and Maintaining • Documentation and Service Costing
<p>8. Discuss sensors and actuators</p> <p>9. Perform the procedure in servicing sensors and actuators</p>	<p>Sensors and Actuators</p> <ul style="list-style-type: none"> • Sensor types • Actuator types • Servicing Procedures <ul style="list-style-type: none"> ○ Common defects and corrective actions ○ Troubleshooting, Repairing, Testing, and Maintaining ○ Documentation and Service Costing

GLOSSARY

Audio System: Components handling sound input, processing, and output in electronic devices.

Closed-Circuit Television (CCTV): A surveillance system for real-time video monitoring.

Component Tester: A device used to test the functionality of electronic components.

Control Board: A circuit board that manages device or system operations.

Electronic Components: Basic building blocks of electronic circuits, such as resistors and capacitors.

Electronic-Controlled Lighting Unit: Lighting systems with electronic control for dimming or color changes.

EPAS (Electronic Products Assembly and Servicing): A vocational field focused on assembling and servicing electronic systems.

Feedback Form: A document for collecting evaluations or suggestions on a product or service.

Fixed Power Supply: A power supply providing constant output voltage.

Heating Component: A device in appliances that generates heat, such as heaters or ovens.

Inventory: A record of tools, components, or products.

Job Order: A document detailing tasks or instructions for servicing or repair.

Layout Transfer Method: Techniques for transferring circuit designs onto printed circuit boards.

PCB (Printed Circuit Board): A board used to connect and support electronic components.

Preventive Maintenance: Scheduled maintenance to prevent failures.

Regulated Power Supply: A system maintaining constant output voltage.

Recording and Reporting Procedures: Methods for documenting service activities and outcomes.

Specialized Hand Tools: Advanced tools for specific servicing tasks, like soldering.

Troubleshooting: Diagnosing and solving problems in systems.

Variable Power Supply: A power supply with adjustable output voltage or current.

Working Principle: The fundamental mechanism by which a device or system operates.

TOOLS, MATERIALS, AND EQUIPMENT

TOOLS	MATERIALS	EQUIPMENT
Pliers assorted, Long nose, Side cutter	Soldering wire	Multimeter (analog/digital)
Screw driver assorted, Phillips, slotted	SMD soldering paste	Workshop table
Desoldering tools	SMD soldering flux	High grade magnifying glass with lamp
Wrenches assorted	Cleaning brush	Variable power supply
Allen wrench/key	Thinner/alcohol	Variable transformer 1
Utility knife/stripper	Thermal paste	Hot air soldering station
Test jigs	Ferric chloride	Oscilloscope, digital
Wire stripper	Pale or water bucket	Signal generator
Digital micrometer	Stranded/solid/ hook-up wires	Function generator
Anti-static strap	wire stranded, #22, red	Electronically-controlled soldering station
Anti-static brush	wire stranded, #22, black	
Anti-static mat	wire stranded, #22, white	
Bread boards	wire stranded, #22, blue	
	wire stranded, #22, yellow	
	wire stranded, #22, green	
	Solid wires, assorted color	
	Assorted electronic components	
	resistors (different values)	
	capacitors (different values)	

REFERENCES

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