Republic of the Philippines

# Department of Education

DepEd Complex, Meralco Avenue, Pasig City

## STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

# MOTORCYCLE AND SMALL ENGINE SERVICING

## Grade 11/12

**Course Description:**
This course equips learners with essential skills in motorcycles and small engines. It covers driving and service, which aims to provide learners with the ability to drive, operate, and service a motorcycle and small engine following industry standards. Upon completion, learners are eligible to earn National Certifications level II in Motorcycle and Small Engine Servicing, higher education, and careers in the automotive industry sector.

**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 I**

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| **CONTENT STANDARD** | The learners demonstrate an understanding of principles in motorcycle driving. |
| **PERFORMANCE STANDARD** | The learners perform driving procedures in motorcycles employing safety precautions. |

| **LEARNING COMPETENCIES** | **CONTENT** |
|---|---|
| 1. Discuss overview of motorcycle driving | Overview of Motorcycle Driving<br>• background of motorcycle driving<br>• terminologies in motorcycle driving<br>• importance of driving<br>• career and business opportunities<br>• major controls and switches of motorcycle<br>• principles of driving<br>o types of motorcycle<br>- according to uses<br>- according to sizes |

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| 2. Perform procedures in maintaining and servicing motorcycle | Motorcycle maintenance and servicing<br>• pre- maintenance and servicing operation<br>o essential parts engine<br>o automatic and manual<br>o semi-automatic<br>Motorcycle maintenance procedures<br>• maintenance of major components<br>o special tools<br>o types of cleaning supplies<br>o waste management |
| 3. Apply procedures in pre-starting and warm-up of motorcycles | Motorcycle pre-starting and warm-up procedures<br>• essential warm-up procedures<br>• principles of small engine operations<br>• inspection procedures of motorcycle parts<br>• hazards in driving<br>• courtesy and discipline in driving<br>• usage of manufacturers specifications in manual |
| 4. Identify traffic rules and regulations | Traffic rules and regulations<br>• Republic Act. 4136<br>• enforcement of traffic laws and regulations<br>• traffic law enforcers/offices<br>o international<br>o national<br>o local government unit<br>• traffic signs, signals, road markers and pavement markings<br>• LTO/LTFRB requirements<br>• motor vehicles registrations<br>• concept of defensive driving<br>• courtesy and discipline in driving |
| 5. Discuss appropriate responses to road emergencies | Road emergencies and their responses<br>• Types of emergencies |

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| | • road emergencies responses |
| 6. Perform procedures in motorcycle driving | Driving motorcycle procedures<br>• types of Motorcycle<br>  ○ automatic<br>  ○ manual<br>  ○ electric<br>  ○ semi-automatic<br>• proper handling of motorcycles<br>• basic balancing<br>• core control techniques in riding<br>• pillion riding |

**QUARTER 2**

| **CONTENT STANDARD** | The learners demonstrate an understanding of the principles in motorcycles/small engine systems. |
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| **PERFORMANCE STANDARD** | The learners perform procedures in servicing of motorcycle/small engine system following safety precautions. |
| **LEARNING COMPETENCIES** | **CONTENT** |
| 1. Discuss overview of motorcycle/small engine services | Overview of motorcycle/small engine system<br>• concepts in motorcycle and small engine servicing<br>• emerging trends<br>• career and business opportunities |
| 2. Discuss motorcycle/small engine services | Motorcycle/small engine services<br>• types of motorcycle/small engine system<br>• motorcycle/small engine system<br>• electrical system<br>• service Chassis<br>• overhaul motorcycle/small engine |

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| 3. Discuss motorcycle/small engine system and common troubles procedures | Motorcycle/small engine system<br>• service fuel system<br>• service intake and exhaust system<br>• service lubrication system<br>• service cooling system<br>• service transmission and clutch system (for motorcycle)<br>Common troubles in motorcycle/small engine system<br>• operation procedures<br>• trouble codes in accordance with service manual<br>  ○ fuel system<br>  ○ intake and exhaust system<br>  ○ lubrication system<br>  ○ cooling system<br>  ○ transmission and clutch system (for motorcycle) |
| 4. Perform procedures in servicing the motorcycle/small engine system | Servicing procedures of motorcycle/small engine sytem<br>• fuel system<br>• intake and exhaust system<br>• lubrication system<br>• cooling system<br>• transmission and clutch system (for motorcycle) |

**QUARTER 3**

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| **CONTENT STANDARD** | The learners demonstrate an understanding of the principles in servicing electrical system and chassis in motorcycle/small engine repair. |
| **PERFORMANCE STANDARD** | The learners perform procedures in electrical system servicing, and chassis servicing in motorcycle/small engine employing safety precautions. |
| **LEARNING COMPETENCIES** | **CONTENT** |
| 1. Discuss concepts and principles of electrical system and chassis servicing in motorcycle/small engine repair | Introduction to motorcycle/small engine repair<br>• service electrical system |

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| | • service chassis |
| 2. Discuss electrical system components | Electrical system components<br>• ignition system<br>• lighting system<br>• charging system<br>• starting system |
| 3. Identify electrical system components' malfunction using tools and equipment | Electrical system of motorcycle/small engine servicing<br>• diagnosis in accordance with the service manual<br>• troubleshooting in accordance with the service manual |
| 4. Perform assembling/disassembling procedures in electrical system components | Procedures in assembling and disassembling of electrical system components<br>• special tools for assembling and disassembling<br>• preparatory activities for assembling and disassembling<br>• install wiring, lighting, ignition, charging and starting system. |
| 5. Discuss the component parts of the motorcycle/small engine chassis | Component parts of motorcycle/small engine chassis<br>• steering and suspension system<br>• final drive system (for motorcycle)<br>• brake system<br>• wheels and tires system |
| 6. Apply the procedures in diagnosing and troubleshooting chassis faults in motorcycles and small engine | Chassis service procedures<br>• steering and suspension system<br>• final drive system (for motorcycle)<br>• brake system<br>• wheels and tires system |

**QUARTER 4**

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| **CONTENT STANDARD** | The learners demonstrate an understanding of the principles in overhauling and elements of costing for motorcycles/small engine services. |
| **PERFORMANCE STANDARD** | The learners perform procedures for overhauling motorcycle engines with safety precautions and compute servicing total costs for the motorcycle/small engine services. |

| **LEARNING COMPETENCIES** | **CONTENT** |
|---|---|
| 1. Discuss procedures in motorcycle/small engine overhauling based on the service manual | Motorcycle engine overhauling procedures<br>• external components<br>• internal components |
| 2. Perform procedures in overhauling motorcycle engine | Motorcycle engine overhauling procedures<br>• types of motorcycle<br>• component parts<br>• disassembling<br>• assembling |
| 3. Perform procedures in testing and inspections of engine performance | Testing and inspections of small engine performance<br>• service manual<br>• emission standards under Phil. Clean Air Act<br>• pre-delivery Inspection (PDI) |
| 4. Discuss service cost of motorcycle/small engine servicing | Motorcycle/Small Engine Servicing<br>• service motorcycle/small engine system<br>• service electrical system<br>• service chassis<br>• overhauling motorcycle and/or small engine |
| 5. Calculate total labor and materials costs for motorcycle/small engine servicing | Service Costing<br>• standard rate<br>• manpower (labor cost)<br>• material costs |

## GLOSSARY

**Brakes** - Critical for safety, these allow riders to slow down or stop. Different types include disc brakes and drum brakes.

**Capacitor Discharge Ignition (CDI)** - Electronic ignition system designed to produce very high voltage, consisting of an exciter coil, a capacitor, diode, silicon-controlled rectifier, and AC ignition coil.

**Engine -** The heart of the motorcycle, which provides the power to move. Motorcycle engines can vary significantly in size and type, affecting the bike's speed and performance.

**Frame** - The structure that holds all parts of the motorcycle together. It can be made from various materials, including steel and aluminum, balancing strength with weight.

**Fuel System** - This includes the fuel tank and injection system, providing the engine with the necessary fuel to operate.

**Motorcycle** - is a motorized vehicle with two wheels. It is powered by an engine and is designed for one or two riders. Unlike cars, motorcycles are lighter and more agile, allowing for quicker maneuvers. This makes them popular for both commuting and recreational riding.

**Suspension** - This system helps absorb shocks from the road, improving comfort and control while riding.

**Tachometer** - The tachometer on a motorcycle tells the speed of the engine in revolutions per minute (RPM).

**Trouble Codes -** In motorcycle and small engine servicing, "trouble codes" typically refer to diagnostic codes displayed by the engine control unit (ECU) through a flashing light on the dashboard, indicating a specific malfunction within the engine system

**Wheels and Tires** - Essential for movement and stability. The size and type of tires can impact handling and performance.

**TOOLS, MATERIALS, AND EQUIPMENT**

| TOOLS | MATERIALS | EQUIPMENT |
|---|---|---|
| T-type box wrench (L 310mm) 8,10,12,14,17mm | Oil beaker | Motorcycle (Carburetor type) |
| T-type screwdriver (+/- No.3 & + No.2) | Funnel | Motorcycle (Fuel Injection type) |
| Different types of Offset wrench | Oiler | Small Engine (Multi-purpose engine) |
| Different sizes of Open-end wrench | Grease | Battery charger |
| Different sizes of Combination wrench | WD40 | Bench vise |
| Philip Screwdriver | Sandpaper | Bench grinder |
| Flat Screwdriver | Steel brush | Air compressor, 2HP |
| Phillips screw driver (+ No.3) (L-150mm) | Wire brush | Parts rack |
| Wiring Flat Screwdriver (200mm) | Rags | Gas Range |
| Carburetor Screwdriver (295mm) | Rectangular steel tray | Sealer |
| Flat screwdriver stubby (L-25mm) | Circular steel tray | Packaging Equipment |
| Phillips screwdriver stubby (No. 2) (L-25mm) | Used oil drum | Television |
| Intensified flat screwdriver (290mm) | Saw dust | Projector |
| Combination pliers (200mm) | Mop | Overhauling engine stand |
| Snap ring pliers (opening type) (L-7 in.) | Broom | Bike lifter or equivalent |
| Snap ring pliers (closing type) | Dustpan | Air impact tool |
| Cutting pliers (150mm) | Trash can | Working table |
| Long nose pliers (150mm) | Service manuals | Table for battery charger |
| Ball peen hammer (450 g) | Parts catalogs | Special tools board hanger |
| Copper hammer (450 g) | Reference books | Toolbox |
| Plastic Soft face hammer (450 g) | Videos | Trouble light |
| Impact driver (6 pcs.) (L-145mm) | Modules / Power point presentation | Mechanical jack |
| Socket wrench (18pcs) (8-27mm) (1/2 Dr.) | | Safety shoes |
| Deep socket wrench (10pcs) (10-24mm) (1/2 DR.) | | Apron |
| Spark plug wrench Compact (6pcs) (3/8 drive) | | Goggles |
| Adjustable wrench (L-305mm) | | Cap |
| Pipe wrench (L-300mm) | | Gloves |

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| Locking Plier – Curved jaw (Vise grip)-210mm | | Gas mask |
| Hexagon–key wrench ><br>High grade L-shape long ball point (8>9 pcs.) (1.5-10mm) | | First Aid Kit |
| Scraper stainless (30mm wide) | | Fire Extinguisher |
| Chisel (10mm wide) (L-140mm) | | |
| Center- punch (4mm) (L-120mm) | | |
| Nipple wrench (Spoke wrench) | | |
| Hacksaw | | |

## REFERENCES


Technical Education and Skills Development Authority–Qualification Standards Office. (n.d.). *Competency-based curriculum: Motorcycle driving level II*.

Technical Education and Skills Development Authority–Qualification Standards Office. (2020, October). *Competency-based curriculum: Motorcycle small engine servicing NC II*.