

**Mission Valley Regional Occupational Program
Basic Car Care
Course Outline**

COURSE TITLE:

Basic Car Care

CBEDS TITLE:

Automotive Mechanics

CBEDS NUMBER:

5655

JOB TITLES/DOT CODES:

Automotive Mechanic	620.261-010
Automobile-Mechanic Helper	620.684-014
Automobile-Repair-Service Estimator	620.261-018
Automotive Technician, Exhaust Emission	620.281-014
Brake Adjuster	620.684-018

COURSE DESCRIPTION:

This course provides pre-entry level training in automotive service/maintenance and is designed to be the first course for students entering transportation technology career pathways. Instruction covers the following areas: engine systems, electrical systems, tires and brakes, lubrication service, cooling systems, ignition and emission device service.

HOURS:

James Logan High School (JLHS)		Washington High School (WHS)	
Class	90	Class	180
CC	0	CC	0
CVE	0	CVE	0
TOTAL	90		

DATE OF REVISION:

October 29, 2020

COURSE OUTLINE:

CLASS HOURS (JLHS/WHS):

I. Career Preparation Standards

(Necessary skills for any occupation – MVROP ESLR #1)

WORKPLACE BASIC SKILLS AND BEHAVIORS

(Integrated throughout course)

- a. Apply skills learned in class
- b. Analyze information and make decisions
- c. Communicate verbally and in writing
- d. Work independently and as a team member in a diverse workplace
- e. Work reliably, responsibly, and ethically

II. Career Technical Skills

(Occupational competencies – MVROP ESLR #2)

a. Technology

(Integrated throughout course)

- i. Select, operate, maintain, and troubleshoot a variety of technologies (tools, machines, computers, etc.).
- ii. Use computers to process information for the numerical system.

b. Safety Standards

(Integrated throughout course)

- i. Comply with personal and environmental safety practices associated with clothing, eye protection, hand tools, power equipment, and proper ventilation.
- ii. Comply with safety and environmental practices associated with handling, storage, and disposal of chemicals or materials in accordance with local, state, and federal regulations.

c. Business Functions

(Integrated throughout course)

- i. Identify, organize, plan, and manage time, materials, and facilities.
- ii. Recognize purpose for administration, operations, marketing, personnel, production, distribution, and services.

III. Career Path Strategies

(Strategic planning for a career – MVROP ESLR #3)

JOB EMPLOYMENT SKILLS

(Integrated throughout course)

- a. Develop a plan to achieve career goals
- b. Use effective job search strategies
- c. Demonstrate an awareness of the importance of lifelong learning

IV. Course Curriculum

a. Introduction to Automotive Technology

(20/40 hours)

- i. The Automobile
 - 1. Parts, Assemblies, and Systems
 - 2. Hybrid Vehicle
- ii. Basic Hand Tools
 - 1. Tool Rules
 - 2. Tool Storage
 - 3. Wrenches, Screwdrivers, Pliers, Hammers, Chisels and Punches, Files, Saws
 - 4. Holding Tools
 - 5. Cleaning Tools
 - 6. Probe and Pickup Tools
 - 7. Pry Bars
- iii. Power Tools and Equipment
 - 1. Compressed-Air System
 - 2. Air Tools
 - 3. Electric Tools
 - 4. Hydraulic Tools
 - 5. Shop Equipment
- iv. Auto Shop and Safety
 - 1. Auto Shop Layout
 - 2. Shop Safety
 - 3. Types of Accidents
 - 4. General Safety Rules
 - 5. Customer Relations
- v. Vehicle Maintenance, Fluid Service, and Recycling
 - 1. Lubrication Service
 - 2. Vehicle Maintenance
 - 3. Fluid Service
 - 4. Filter Service
 - 5. Chassis Lubrication
 - 6. Service Intervals
 - 7. General Inspection and Problem Location
 - 8. Recycling and Disposal of Auto Shop Wastes

b. Label Identification

(1/2 hours)

- i. Fluid Labels
- ii. Emission Labels
- iii. Vehicle Identification Number

c. 29-Point Inspection

(1.5/3 hours)

- i. Engine
- ii. Transmission
- iii. Suspension
- iv. Tires

- v. Safety Belts and Interior
- vi. Lighting Systems
- d. **Road Hazard/Tire Replacement** *(2.5/5 hours)*
 - i. Road Hazards
 - ii. Freeway Hazards
 - iii. Car Jack Usage
 - iv. Flares and Signs
 - v. Common Sense
- e. **Engines** *(5/10 hours)*
 - i. Engine Fundamentals
 - 1. Engine Operation
 - 2. Engine Bottom End
 - 3. Engine Top End
 - 4. Engine Front End
 - ii. Engine Design Classifications
 - 1. Engine Classifications
 - 2. Cylinder Arrangement
 - 3. Alternative Engines
 - 4. Typical Automotive Engines
- f. **Cooling and Lubrication Systems** *(7.5/15 hours)*
 - i. Cooling System Fundamentals
 - 1. Cooling System Functions and Operations
 - 2. Cooling System Types
 - 3. Basic Cooling System
 - 4. Closed and Open Cooling System
 - 5. Cooling System Instrumentation
 - 6. Antifreeze
 - 7. Block Heater
 - 8. Focus on Hybrids
 - ii. Cooling System Testing, Maintenance, and Repair
 - 1. Cooling System Problems and Diagnosis
 - 2. Thermostat Service
 - 3. Cooling System Hose Service
 - 4. Radiator and Pressure Cap Service
 - 5. Fan Belt Service
 - 6. Coolant Service
 - iii. Lubrication System Testing, Service, and Repair
 - 1. Lubrication System Problem Diagnosis
 - 2. Engine Oil and Filter Service
- g. **Electrical Systems** *(7.5/15 hours)*
 - i. Automotive Batteries
 - 1. Battery Principles
 - 2. Battery Functions
 - 3. Battery Construction

4. Maintenance-Free Battery
5. Gel Battery
6. Battery Ratings
7. Battery Temperature and Efficiency
8. Hybrids Overall
- ii. Battery Testing and Service
 1. Battery Maintenance
 2. Jump Starting
 3. Removing and Replacing a Battery
 4. Battery Diagnosis
- iii. Lights, Instrumentation, Wipers, and Horns – Operation and Service
 1. Lighting Systems and Service
 2. Instrumentation
 3. Windshield Wipers
 4. Horns
 5. Finding Common Electrical Problems
 6. Headlamp and Turn Signal Diagnosis
- h. **Engine Performance** *(5/10 hours)*
 - i. Engine Tune-Up
 1. Engine Performance Checks
 2. General Engine Performance Rules
 3. Engine Performance Safety Rules
 4. Typical Engine Performance Procedures
 5. Diesel Engine Performance (Maintenance)
 6. Engine Performance (Maintenance) Intervals
 - i. **Suspension, Steering, and Brakes** *(20/40 hours)*
 - i. Tire, Wheel, and Wheel Bearing Fundamentals
 1. Tires and Wheels
 2. Valve Stems and Cores, Lug Nuts, Studs, and Bolts
 3. Wheel Weights
 - ii. Suspension System Fundamentals
 1. Functions of a Suspension System
 2. Basic Suspension System
 3. Independent and Non-Independent Suspension Systems
 4. Suspension System Springs and Construction
 5. Torsion Bar Suspension
 6. MacPherson Strut Suspension
 7. Pickup Truck Suspension Systems
 8. Rear Suspension Systems
 - iii. Brake System Fundamentals
 1. Basic Brake System
 2. Braking Ratio
 3. Brake System Hydraulics
 4. Brake System Components

5. Parking Brakes
6. Anti-Lock Brake Systems
7. Focus on Hybrids
- iv. Brake System Diagnosis and Repair
 1. Brake System Problem Diagnosis and Inspection
 2. Disc Brake Service
 3. Brake Disc (Rotor) Service
 4. Drum Brake Service
 5. Parking Brake Adjustment
 6. Brake System Diagnosis
- j. **Computer Systems** *(10/20 hours)*
 - i. On-Board Diagnostic Systems
- k. **Fuels Systems** *(10/20 hours)*
 - i. Automotive Fuels, Gasoline and Diesel Combustion
 1. Petroleum (Crude Oil)
 2. Gasoline
 3. Diesel Fuel
 4. Alternative Fuels
 - ii. Fuel Injection Operation
 1. Basic Fuel Injection
 - iii. Carburetor Operation Service
 1. Basic Carburetor
 - iv. Exhaust Systems, Turbochargers, and Superchargers
 1. Exhaust Systems and Service
 2. Superchargers and Turbochargers

TOTAL COURSE APPROVED HOURS = 90 / 180

ADDITIONAL ITEMS:

- a. **Articulation:** This course is not articulated with a college.
- b. **UC/CSU A-G Eligibility:** This course does not meet the UC/CSU A-G requirements.
- c. **Instructional Strategies:**
 - Lecture
 - Group Discussion
 - Projects
 - Reading Assignments
 - Oral Questioning
 - Multi-Media
 - Hands-on Practice
 - Demonstration
 - Team Learning

- Simulation

d. Instructional Materials:

- *The Car Care Book, 3rd edition, Haefner, Delmar Learning, 2004. (JLHS)*
- *Automotive Technology, 5th edition, Halderman, Pearson Publishing, 2016 (JLHS / WHS)*

e. Completion Certificate Competencies

Career Preparation Standards:

- Apply workplace basic skills and behaviors
- Practice occupational safety standards
- Demonstrate effective job employment skills

Career Technical Skills:

- Demonstrates safe working conditions in classroom and shop
- Identify common automotive tools and equipment
- Demonstrate proper usage of tools and equipment
- Perform vehicle safety inspection
- Check fluids accurately
- Perform engine oil and filter service and chassis lubrication
- Perform tire repair and replacement
- Complete repair order accurately
- Demonstrate part removal and replacement
- Use appropriate methods for disposal of hazardous waste material