

**COURSE OUTLINE****Course:** 18888 AUTOMOTIVE TECHNOLOGY**Total Course Hours:** 360.00**CBEDS Title:** AUTOMOTIVE TECHNOLOGY**CBEDS #:** 1888**Job Title(s):**

Automobile Mechanic, Automobile Mechanic Apprentice, Automobile Mechanic Helper

**Prerequisites:**

None

**Course Description:**

This course is designed to prepare students for entry-level employment in the automotive field. Emphasis will be placed on the safe and proper use of tools and equipment used by the automotive technician and apprentice helper. Topics of instruction include major automobile repair work, tune-up, brakes, valve grinding, and also transmission repair work. Integrated throughout the course are career technical and academic content standards, which include basic skills, communication, interpersonal skills, problem solving, safety, technology, and other employment skills.

Hours	
Class	OJT

**Occupational Competencies**

1-7 on the Course Outline are generic to all BVROP courses and include the BVROP Student Outcomes

3.00	3.00	<b>1</b>	<b><u>ORIENTATION</u></b>	<ul style="list-style-type: none"> <li>A Identifies and discusses course objectives and competencies.</li> <li>B Discusses ROP Student Outcomes.</li> <li>C Explains class attendance and behavior objectives.</li> </ul>
3.00	3.00	<b>2</b>	<b><u>HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT</u></b>	<ul style="list-style-type: none"> <li>A Describes accident procedure.</li> <li>B Demonstrates appropriate safety practices (e.g. bending, lifting, etc.).</li> <li>C Demonstrates knowledge of classroom procedures and drills (e.g. earthquake, fire and emergency).</li> </ul>
3.00	3.00	<b>3</b>	<b><u>ETHICS AND LEGAL RESPONSIBILITIES</u></b>	<ul style="list-style-type: none"> <li>A Defines sexual harassment and discusses tactics for handling harassment situations.</li> <li>B Applies appropriate workplace behavior and standards.</li> </ul>
3.00	3.00	<b>4</b>	<b><u>LEADERSHIP AND TEAMWORK</u></b>	<ul style="list-style-type: none"> <li>A Describes the characteristics and benefits of teamwork and leadership.</li> <li>B Demonstrates ability to make appropriate decisions.</li> <li>C Works well with others and gives/takes constructive criticism.</li> </ul>
15.00	15.00	<b>5</b>	<b><u>CAREER PLANNING</u></b>	<ul style="list-style-type: none"> <li>A Prepares a finished, professional portfolio showing the best work that has been completed during the class.</li> <li>B Locates job opportunities through the use of want-ads and placement agencies.</li> <li>C Visits at least one facility related to area of training and observes jobs performed.</li> <li>D Completes a job application correctly.</li> <li>E Prepares for and critiques a simulated employment interview.</li> <li>F Discusses employee benefits and rights as related to the specific occupational job area including gender equity and equal opportunity.</li> <li>G Identifies acceptable procedures to leave a job.</li> <li>H Applies for a scholarship.</li> <li>I Completes a professional resume.</li> <li>J Demonstrates appropriate personal grooming and dress.</li> </ul>

Hours	
Class	OJT

3.00	3.00
------	------

**6 COMMUNICATION**

- A Uses effective workplace conversation.
- B Reads and interprets written information and directions.
- C Practices various forms of written communication appropriate to the occupation.

3.00	3.00
------	------

**7 STUDENT OUTCOMES**

- A Demonstrates Occupational Specific, Communication and Critical Thinking Skills
- B Demonstrates Responsible Work Ethics
- C Demonstrates Career/Employment Literacy
- D Demonstrates Effective Use of Technology

6.00	6.00
------	------

**8 LEGAL ASPECTS**

- A Defines the scope of practice of the auto mechanic
- B Discusses the laws that affect the auto mechanic
- C Explains how consumer protection laws affect the auto mechanic
- D Discusses OSHA guidelines relating to the auto repair environment and hazard materials
- E Understands the meaning of verbal and written contracts
- F Writes the diagnostic result and an estimate for the labor and parts appropriate to industry standards
- G Identifies safety measures including the handling and disposal of hazardous chemicals and use of protective gear while working with fuel systems

6.00	6.00
------	------

**9 VEHICLE MAINTENANCE UNDERHOOD AND UNDER VEHICLE**

- A Identifies the purpose of lubrication fluids
- B Demonstrates knowledge of friction, viscosity and lubrication types consistent with industry standards
- C Uses compression on a gauge, an oil pressure gauge and a steeple scope to diagnose and troubleshoot engine problems
- D Demonstrates checking and changing power steering fluid, engine oil, transmission fluid, final drive units and other vehicle fluids
- E Changes oil and oil filters, transmission fluid and filters and brake fluids according to manufacturer's specifications
- F Performs preventive maintenance on a drive train following manufacturer's specifications

4.00	4.00
------	------

**10 HAND AND POWER TOOLS**

- A Identifies hand tools and their uses
- B Discusses safety measures regarding the use of hand tools
- C Uses hand tools appropriately
- D Identifies the names, uses, and safety precautions of power tools including the use of personal protective equipment
- E Uses power tools appropriately
- F Identifies diagnostic equipment
- G Applies, tests and diagnoses problems with various types of diagnostic equipment

14.00	14.00
-------	-------

**11 INTERNAL COMBUSTION ENGINES**

- A Discusses safety measures to consider while working with internal combustion engines
- B Identifies the design of 4 internal combustion engines
- C Describes the construction of 4 internal combustion engines
- D Labels the components and accessories of an internal combustion engine
- E Differentiates among internal combustion engines regarding classification, fuel burned, cooling type, and type of valve arrangement
- F Performs engine service following individual manufacturer's specifications
- G Demonstrates cleaning techniques following individual manufacturer's specifications
- H Understands heat transfer air-cooling and water-cooling systems
- I Labels components of air-cooling and water-cooling systems
- J Understands the basic engine principals of electric vehicles, i.e. hybrid & hydrogen vehicles

Hours	
Class	OJT

7.00	7.00	<b>12 <u>AUTOMOTIVE FUEL SYSTEMS</u></b>
------	------	--

- A Identifies safety measures to consider when working with emission control systems
- B Identifies and describe the functions of the parts of a fuel injection system
- C Differentiates among the types of fuels and their uses
- D Explains the procedure for servicing fuel systems
- E Services various fuel systems

5.00	5.00	<b>13 <u>EMISSION CONTROL SYSTEMS</u></b>
------	------	---

- A Discusses safety measures to consider when working with emission control systems
- B Identifies the P.C. valve and service it
- C Describes the EGR system
- D Describes the evaporation control system
- E Identifies and explain the exhaust gas recirculation system
- F Identifies and explain the exhaust gas recirculation system
- G Explains the operation of the electronic control system
- H Labels the different parts in the exhaust gas recirculation and explains their functions
- I Identifies the components of fuel vapor controls, and explains their function

4.00	4.00	<b>14 <u>AUTOMOTIVE CLUTCH MECHANISM</u></b>
------	------	--

- A Identifies and explains the function of the flywheel
- B Identifies and explains the function of the friction disc
- C Identifies and explains the function of the pressure plate
- D Identifies and explains the function of a release bearing fork
- E Traces the linkages of a mechanical clutch system
- F Traces the linkages of a hydraulic clutch system
- G Adjusts a mechanical and a hydraulic clutch system following manufacturer's specification

4.00	4.00	<b>15 <u>MANUAL TRANSMISSIONS</u></b>
------	------	---------------------------------------

- A Discusses safety factors to consider when working with manual transmissions
- B Identifies gears and shafts in a manual transmission
- C Traces the power flow of manual transmissions on a diagram

4.00	4.00	<b>16 <u>AUTOMATIC TRANSMISSIONS</u></b>
------	------	--

- A Discusses safety factors to consider when working with automatic transmissions
- B Traces the power flow of oil through the torque converter and transmission
- C Labels the parts of the planetary gear set
- D Labels the parts of a clutch, band, and friction elements

4.00	4.00	<b>17 <u>AUTOMOTIVE FINAL DRIVE UNITS</u></b>
------	------	---

- A Discusses safety measures to consider when working with a drive train
- B Identifies parts of propeller shafts
- C Labels all parts of the universal joints on a diagram
- D Identifies the parts and discusses the operation of a constant velocity joint
- E Identifies 2 types of axles
- F Identifies parts of differentials

Hours	
Class	OJT

20.00	20.00	<b>18 <u>AUTOMOTIVE SUSPENSION SYSTEMS</u></b>
-------	-------	--

- A** Discusses safety factors to consider when working with automotive suspension systems
- B** Describes types of frame construction
- C** Describes types of springs
- D** Removes and installs springs
- E** Describes types of front suspension
- F** Describes types of rear suspension
- G** Describes types of control arms
- H** Removes and installs control arms
- I** Describes shock absorbers and struts
- J** Removes and installs shock absorbers
- K** Discusses the operation of a ball joint
- L** Describes types of steering systems
- M** Removes and installs steering components
- N** Explains the difference between caster, camber, and toe-in on a front-end alignment rack
- O** Explains test types of suspension damage

10.00	10.00	<b>19 <u>TIRES, WHEEL AND BEARINGS</u></b>
-------	-------	--

- A** Identifies types of wheel bearings
- B** Demonstrates proper procedure for checking, replacing, and/or adjusting wheel bearings
- C** Explains procedure for checking CV joints
- D** Demonstrates the proper procedures for replacing axle boots
- E** Shows an ability to properly check run out on both tires and wheels
- F** Demonstrates proper procedure of wheel balance
- G** Describes types of tire wear
- H** Demonstrates procedure for removing and replacing tire on a wheel

20.00	20.00	<b>20 <u>BRAKING SYSTEM COMPONENTS</u></b>
-------	-------	--

- A** Discusses safety factors to consider when working with brake systems
- B** Disassembles, identifies components, and reassembles a master cylinder
- C** Disassembles, identifies components, and reassembles a wheel cylinder
- D** Removes and replaces brake shoes, with the sensors on the external side
- E** Identifies drum assemblies
- F** Identifies rotor-caliper assembly
- G** Discusses the operation of vacuum assist brake units
- H** Repairs different types of brake systems
- I** Performs brake service following manufacturer's specifications
- J** Describes the principles of the ABS system

Hours	
Class	OJT

20.00	20.00	<b>21 <u>AUTOMOTIVE ELECTRICAL SYSTEMS</u></b>
-------	-------	--

- A** Discusses safety factors to consider when working with electrical systems
- B** Describes voltage in terms of electromotive force (EMF)
- C** Describes current flow as a mass movement of electrons through a conductor wire
- D** Describes the pattern of current flow in an alternating circuit.
- E** Measures the resistance when current flows through a conductor wire
- F** Tests wires for resistance and voltage following industry standards
- G** Measures electrical flow across a circuit when connected
- H** Locates and installs the points, condenser, and coil on at least 2 distributors
- I** Diagnoses, repairs, and tests at least 2 distributors
- J** Reads and understands electrical schematics and diagnostic systems
- M** Labels and identifies series circuits and parallel circuits on a diagram
- N** Tests fuses and circuit breakers with various testing equipment
- O** Discusses the role of the microprocessor in electronic systems
- P** Identifies at least 8 electricity components in the electrical system
- Q** Explains the difference between distributor less transistor and electronic distributor systems
- R** Demonstrates ability to identify High and Low Voltage Systems
- S** Demonstrates ability to use code reader/scanner
- T** Demonstrates ability to remove and replace dashboard for diagnostic testing

10.00	10.00	<b>22 <u>AUTOMOTIVE CHARGING SYSTEM</u></b>
-------	-------	---

- A** Discusses safety factors to consider when working with charging systems
- B** Describes how the alternator generate voltage
- C** Discusses the construction of the chemical storage battery
- D** Discusses legalities regarding the use of a customer's old alternator
- E** Demonstrates ability to test charging system with a VAT Tester

9.00	9.00	<b>23 <u>AUTOMOTIVE STARTING SYSTEMS</u></b>
------	------	--

- A** Discusses electrical safety considerations with working with starting systems
- B** Defines electromagnetism
- C** Demonstrates ability to test, check and service the automotive battery
- D** Tests amperage draw using a VAT-40 tester
- E** Identifies a Bendix drive starter motor and describe its operation
- F** Diagnoses and service a starting system using various electrical testing equipment

**TOTAL HOURS**

Class	OJT	Course
<b>180.00</b>	<b>180.00</b>	<b>360.00</b>