



Department of Teaching & Learning
Parent/Student Course Information

Automotive Service Technology II
(VO8507)
Three Credits, One Year
Grades 11 or 12

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

This two-year program includes the study of engine repair, engine performance, electricity/electronics, brakes, steering and suspension. In the classroom students will study automotive theory and apply these principles to practical use in the lab. The program prepares graduates to pursue ASE certification as well as provides them the opportunity to participate in the AYES (Automotive Youth Educational Systems) program, which begins with an internship in the summer of their junior year.

CERTIFICATION

Automotive Service Excellence and Automotive Youth Educational Systems both offer: Engine Repair, Automatic Transmission, Manual Drive Trains and Axles, Steering/Suspension, Brakes, Electrical/Electronic Systems, Heating and A/C and Engine Performance Certifications Environmental Protection Agency (EPA): Safety and Pollution Prevention Certification, National Occupational Competency Testing Institute/ Automotive Technician

STUDENT ORGANIZATION

SkillsUSA is a co-curricular organization for all students enrolled in trade and industrial education programs. SkillsUSA is a partnership of students, teachers and industry working together to ensure America has a skilled workforce. SkillsUSA helps students excel by providing educational programs, events and competitions that support career and technical education (CTE) in the nation's classrooms. Students are highly encouraged to participate.

PREREQUISITE

Auto Service Technology I

OPTIONS FOR NEXT COURSE

None

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR AUTO SERVICE TECHNOLOGY II

Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills

- 1 Demonstrate positive work ethic.
- 2 Demonstrate integrity.
- 3 Demonstrate teamwork skills.
- 4 Demonstrate self-representation skills.
- 5 Demonstrate diversity awareness.
- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate creativity and resourcefulness.

Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills

- 8 Demonstrate effective speaking and listening skills.
- 9 Demonstrate effective reading and writing skills.
- 10 Demonstrate critical-thinking and problem-solving skills.
- 11 Demonstrate healthy behaviors and safety skills.
- 12 Demonstrate an understanding of workplace organizations, systems, and climates.
- 13 Demonstrate lifelong-learning skills.
- 14 Demonstrate job-acquisition and advancement skills.
- 15 Demonstrate time-, task-, and resource-management skills.
- 16 Demonstrate job-specific mathematics skills.
- 17 Demonstrate customer-service skills.

Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills

- 18 Demonstrate proficiency with technologies common to a specific occupation.
- 19 Demonstrate information technology skills.
- 20 Demonstrate an understanding of Internet use and security issues.
- 21 Demonstrate telecommunications skills.

Examining All Aspects of an Industry

- 22 Examine aspects of planning within an industry/organization.
- 23 Examine aspects of management within an industry/organization.
- 24 Examine aspects of financial responsibility within an industry/organization.
- 25 Examine technical and production skills required of workers within an industry/organization.
- 26 Examine principles of technology that underlie an industry/organization.
- 27 Examine labor issues related to an industry/organization.
- 28 Examine community issues related to an industry/organization.
- 29 Examine health, safety, and environmental issues related to an industry/organization.

Addressing Elements of Student Life

- 30 Identify the purposes and goals of the student organization.
- 31 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
- 32 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.
- 33 Identify Internet safety issues and procedures for complying with acceptable use standards.

Lab/Shop and Personal Safety

- 34 Identify general lab/shop safety rules and procedures.
- 35 Utilize safe procedures for handling tools and equipment.
- 36 Identify and use proper placement of floor jacks and jack stands.
- 37 Identify and use proper procedures for safe lift operation.
- 38 Use proper ventilation procedures for working in the lab/shop area.
- 39 Identify marked safety areas.
- 40 Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.

- 41 Identify the location and use of eye wash stations.
- 42 Identify the location of posted evacuation routes.
- 43 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
- 44 Identify and wear appropriate clothing for lab/shop activities.
- 45 Secure hair and jewelry for lab/shop activities.
- 46 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high-voltage circuits.
- 47 Demonstrate awareness of the safety aspects of high-voltage circuits such as high intensity discharge (HID) lamps, ignition systems, and injection systems.
- 48 Locate and demonstrate knowledge of safety data sheets (SDS).

General

- 49 Install engine covers using gaskets, seals, and sealers as required.
- 50 Verify engine mechanical timing.
- 51 Verify operation of the instrument panel engine warning indicators.
- 52 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
- 53 Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.

Cylinder Head and Valve Train

- 54 Adjust valves (mechanical or hydraulic lifters).
- 55 Identify components of the cylinder head and valve train.

In-Vehicle Transmission/Transaxle

- 56 Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.
- 57 Inspect for leakage at external seals, gaskets, and bushings.

In-Vehicle Transmission/Transaxle

- 58 Inspect, replace, and/or align power train mounts.

Off-Vehicle Transmission and Transaxle

- 59 Describe the operational characteristics of a continuously variable transmission (CVT).
- 60 Describe the operational characteristics of a hybrid vehicle drive train.

Transmission/Transaxle

- 61 Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.

Drive Shaft, Half Shafts, Universal Joints, and Constant-Velocity (CV) Joints (Front, Rear, All, and Four-wheel Drive)

- 62 Inspect, remove, and/or replace bearings, hubs, and seals.
- 63 Inspect, service, and/or replace shafts, yokes, boots, and universal/constant-velocity (CV) joints.
- 64 Inspect locking hubs.
- 65 Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.

Differential Case Assembly

- 66 Clean and inspect differential case; check for leaks; inspect housing vent.

General

- 67 Disable and enable supplemental restraint system (SRS).

Wheel Alignment

- 68 Perform prealignment inspection; measure vehicle ride height.
- 69 Describe alignment angles (camber, caster, and toe).

Electronic Brakes, Traction Control, and Stability Control Systems

- 70 Identify traction control/vehicle stability control system components.
- 71 Describe the operation of a regenerative braking system.

General

- 72 Research vehicle service information, including vehicle service history, service precautions, and technical service bulletins.
- 73 Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's law).
- 74 Identify lane departure and radar cruise systems.
- 75 Use wiring diagrams to trace electrical/electronic circuits.
- 76 Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance.
- 77 Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.
- 78 Check operation of electrical circuits using a test light.
- 79 Use fused jumper wires to check operation of electrical circuits.
- 80 Measure key-off battery drain (parasitic draw).
- 81 Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.
- 82 Repair and/or replace connectors, terminal ends, and wiring of electrical/electronic systems (including solder repair).

Battery Service

- 83 Perform battery state-of-charge test; determine necessary action.
- 84 Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine necessary action.
- 85 Maintain or restore electronic memory functions.
- 86 Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.
- 87 Perform slow/fast battery charge according to manufacturer recommendations.
- 88 Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.
- 89 Identify safety precautions for high-voltage systems on electric, hybrid-electric, and diesel vehicles.
- 90 Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.
- 91 Identify hybrid vehicle auxiliary (12V) battery service, repair, and test procedures.

Starting System

- 92 Perform starter current draw test; determine necessary action.
- 93 Perform starter circuit voltage drop tests; determine necessary action.
- 94 Inspect and test starter relays and solenoids; determine necessary action.
- 95 Remove and install starter in a vehicle.
- 96 Inspect and test switches, connectors, and wires of starter control circuits; determine necessary action.
- 97 Demonstrate knowledge of an automatic idle-stop/start-stop system.

Charging System

- 98 Perform charging system output test; determine necessary action.
- 99 Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment.
- 100 Remove, inspect, and/or replace generator (alternator).
- 101 Perform charging circuit voltage drop tests; determine necessary action.

Lighting, Instrument Cluster, Driver Information, and Body Electrical Systems

- 102 Inspect interior and exterior lamps and sockets, including headlights and auxiliary lights (fog lights/driving lights); replace as needed.
- 103 Aim headlights.
- 104 Identify system voltage and safety precautions associated with high-intensity discharge (HID) headlights.
- 105 Disable and enable supplementary restraint system (SRS); verify indicator lamp operation.
- 106 Remove and reinstall door panel.
- 107 Describe the operation of keyless entry/remote-start systems.

108 Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators.

109 Verify windshield wiper and washer operation; replace wiper blades.

General

110 Research vehicle service information, including refrigerant/oil type, vehicle service history, service precautions, and technical service bulletins.

111 Identify heating, ventilation and air conditioning (HVAC) components and configuration.

Refrigeration System Components

112 Inspect and replace air conditioning (AC) compressor drive belts, pulleys, and tensioners; visually inspect AC components for signs of leaks; determine needed action.

113 Identify hybrid vehicle AC system electrical circuits and the service/safety precautions.

114 Inspect AC condenser for airflow restrictions; determine necessary action.

Heating, Ventilation, and Engine Cooling Systems

115 Inspect engine cooling and heater system hoses and pipes; determine necessary action.

Operating Systems and Related Controls

116 Inspect AC-heater ducts, doors, hoses, cabin filters, and outlets; determine necessary action.

117 Identify the source of HVAC system odors.

General

118 Research vehicle service information, including fuel type, vehicle service history, service precautions, and technical service bulletins.

119 Perform engine absolute manifold pressure tests (vacuum/boost); document results.

120 Perform cylinder power balance test; document results.

121 Perform cylinder cranking and running compression tests; document results.

122 Perform cylinder leakage test; document results.

123 Verify engine operating temperature.

124 Remove and replace spark plugs; inspect secondary ignition components for wear and damage.

Computerized Engine Controls

125 Retrieve and record diagnostic trouble codes (DTC), on-board diagnostic (OBD) monitor status, and freeze frame data; clear codes when applicable.

126 Describe the use of the OBD monitors for repair verification.

Fuel, Air Induction, and Exhaust Systems

127 Replace fuel filter(s) where applicable.

128 Inspect, service, or replace air filters, filter housings, and intake duct work.

129 Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; determine necessary action.

130 Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine necessary action.

131 Check and refill diesel exhaust fluid (DEF).

Emissions Control Systems

132 Inspect, test, and service positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform necessary action.

Local Competencies

Following State Safety Inspection Procedures

133 Remove old inspection sticker.

134 Drive vehicle into inspection lane.

135 Inspect brakes.

136 Inspect parking brake.

137 Inspect headlights.

138 Inspect other lights.

139 Inspect signal device.

140 Inspect steering and suspension.

141 Inspect tires, wheels, and rims.

- 142 Inspect mirror.
- 143 Inspect horn.
- 144 Inspect windshield and other glass.
- 145 Inspect windshield wiper/defroster.
- 146 Inspect exhaust system.
- 147 Inspect license tags.
- 148 Inspect hood and area under the hood.
- 149 Inspect air pollution control system.
- 150 Inspect driver's seat.
- 151 Inspect seat belts.
- 152 Inspect doors at the right and left sides of the driver's seat.
- 153 Inspect fuel system.
- 154 Inspect floor pan.
- 155 Issue sticker, if approved.

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For further information please call (757) 263-1070.

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To seek resolution of grievances resulting from alleged discrimination or to report violations of these policies, please contact the Title VI/Title IX Coordinator/Director of Student Leadership at (757) 263-2020, 1413 Laskin Road, Virginia Beach, Virginia, 23451 (for student complaints) or the Section 504/ADA Coordinator/Chief Human Resources Officer at (757) 263-1133, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (for employees or other citizens). Concerns about the application of Section 504 of the Rehabilitation Act should be addressed to the Section 504 Coordinator/ Executive Director of Student Support Services at (757) 263-1980, 2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Laskin Road Annex, 1413 Laskin Road, Virginia Beach, Virginia, 23451.

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CHARTING THE COURSE

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