



Department of Teaching & Learning
Parent/Student Course Information

Automotive Service Technology I
(VO8506)
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

None

OPTIONS FOR NEXT COURSE

Auto Service Technology II

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR AUTO SERVICE TECHNOLOGY I

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).

Tools and Equipment

- 49 Identify tools and their usage in automotive applications.
- 50 Identify standard and metric measurement designations.
- 51 Demonstrate safe handling and use of appropriate tools.
- 52 Demonstrate cleaning, storage, and maintenance of tools and equipment.
- 53 Demonstrate use of precision measuring tools (i.e., micrometer, dial-indicator, dial-caliper).

Preparing Vehicle for Service

- 54 Identify information needed and the service requested on a repair order.
- 55 Identify purpose and demonstrate proper use of fender covers and mats.
- 56 Demonstrate use of the three Cs (i.e., concern, cause, and correction).
- 57 Review vehicle service history.
- 58 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Preparing Vehicle for Customer

- 59 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).
- 60 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
- 61 Verify operation of the instrument panel engine warning indicators.
- 62 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
- 63 Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.

Lubrication and Cooling Systems

- 64 Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine needed action.
- 65 Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.
- 66 Remove, inspect, and replace thermostat and gasket/seal.
- 67 Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.
- 68 Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required.
- 69 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
- 70 Check fluid level in a transmission or a transaxle equipped with a dipstick.
- 71 Check fluid level in a transmission or a transaxle not equipped with a dipstick.
- 72 Check transmission fluid condition; check for leaks.
- 73 Identify drive-train components and configuration.

In-Vehicle Transmission/Transaxle

- 74 Inspect for leakage at external seals, gaskets, and bushings.
- 75 Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.
- 76 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
- 77 Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.
- 78 Check fluid condition; check for leaks.

Clutch

- 79 Check and adjust clutch master cylinder fluid level; use proper fluid type per manufacturer specifications.
- 80 Check for hydraulic system leaks.

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

- 81 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

- 82 Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.
- 83 Drain and refill differential housing.
- 84 Inspect and replace drive axle wheel studs.
- 85 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.

Related Suspension and Steering Service

- 86 Inspect rack-and-pinion steering gear inner tie-rod ends (sockets) and bellows boots.
- 87 Inspect power steering fluid level and condition.
- 88 Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification.
- 89 Inspect for power steering fluid leakage.
- 90 Remove, inspect, replace, and/or adjust power steering pump drive belt.
- 91 Inspect and replace power steering hoses and fittings.
- 92 Inspect pitman arm, relay (center link/intermediate) rod, idler arm, mountings, and steering linkage damper.
- 93 Inspect tie rod ends (sockets), tie rod sleeves, and clamps.
- 94 Inspect upper and lower control arms, bushings, and shafts.
- 95 Inspect and replace rebound and/or jounce bumpers.
- 96 Inspect track bar, strut rods/radius arms, and related mounts and bushings.
- 97 Inspect upper and lower ball joints (with or without wear indicators).
- 98 Inspect suspension system coil springs and spring insulators (silencers).
- 99 Inspect suspension system torsion bars and mounts.
- 100 Inspect and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.
- 101 Inspect, remove, and/or replace strut cartridge or assembly; inspect mounts and bushings.
- 102 Inspect front strut bearing and mount.
- 103 Inspect rear suspension system lateral links/arms (track bars) and control (trailing) arms.
- 104 Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts.
- 105 Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.
- 106 Inspect electric power steering assist system.
- 107 Identify hybrid vehicle power steering system electrical circuits and safety precautions.
- 108 Describe the function of suspension and steering control systems and components (i.e., active suspension and stability control).

Wheel Alignment

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

- 111 Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label.
- 112 Rotate tires according to manufacturer's recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).
- 113 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.
- 114 Dismount, inspect, and remount tire on wheel equipped with TPMS sensor.
- 115 Inspect tire and wheel assembly for air loss; determine necessary action.
- 116 Repair tire following vehicle manufacturer approved procedure.
- 117 Identify tire pressure monitoring systems (indirect and direct); calibrate system; verify operation of instrument panel lamps.
- 118 Demonstrate knowledge of steps required to remove and replace sensors in a TPMS including relearn procedure.
- 119 Research vehicle service information, including fuel type, vehicle service history, service precautions, and technical service bulletins.
- 120 Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).

Hydraulic System

- 121 Describe proper brake pedal height, travel, and feel.
- 122 Check master cylinder for external leaks and proper operation.
- 123 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports.
- 124 Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.
- 125 Identify components of hydraulic brake warning light system.
- 126 Bleed and/or flush brake system.
- 127 Test brake fluid for contamination.

Drum Brakes

- 128 Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.
- 129 Refinish brake drum and measure final drum diameter; compare with specification.
- 130 Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.
- 131 Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.
- 132 Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; make final checks and adjustments.
- 133 Install wheel and torque lug nuts.

Disc Brakes

- 134 Remove and clean caliper assembly; inspect for leaks and damage/wear; determine necessary action.
- 135 Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action.
- 136 Remove, inspect, and/or replace brake pads and retaining hardware; determine necessary action.
- 137 Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads and inspect for leaks.
- 138 Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine necessary action.
- 139 Remove and reinstall/replace rotor.
- 140 Refinish rotor on vehicle; measure final rotor thickness and compare with specification.
- 141 Refinish rotor off vehicle; measure final rotor thickness and compare with specification.
- 142 Retract and readjust caliper piston on an integrated parking brake system.
- 143 Check brake pad wear indicator; determine necessary action.
- 144 Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations.

Power-Assist Units

- 145 Check brake pedal travel with and without engine running to verify proper power booster operation.
- 146 Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.

Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical)

- 147 Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.
- 148 Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.
- 149 Check parking brake operation and parking brake indicator light system operation; determine necessary action.
- 150 Check operation of brake stop light system.
- 151 Replace wheel bearing and race.

Aaron C. Spence, Ed.D., Superintendent
Virginia Beach City Public Schools
2512 George Mason Drive, Virginia Beach, VA 23456-0038

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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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