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

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.
Identify and wear appropriate clothing for lab/shop activities.
Secure hair and jewelry for lab/shop activities.
Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high-voltage circuits.
Demonstrate awareness of the safety aspects of high-voltage circuits such as high intensity discharge (HID) lamps, ignition systems, and injection systems.
Locate and demonstrate knowledge of safety data sheets (SDS).

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

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

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

Lubrication and Cooling Systems
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.
Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.
Remove, inspect, and replace thermostat and gasket/seal.
Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.
Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required.
Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
Check fluid level in a transmission or a transaxle equipped with a dipstick.
Check fluid level in a transmission or a transaxle not equipped with a dipstick.
Check transmission fluid condition; check for leaks.
Identify drive-train components and configuration.

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

**Clutch**

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

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

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**

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

**Related Suspension and Steering Service**

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

**Wheel Alignment**

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

Rotate tires according to manufacturer’s recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).

Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.

Dismount, inspect, and remount tire on wheel equipped with TPMS sensor.

Inspect tire and wheel assembly for air loss; determine necessary action.

Repair tire following vehicle manufacturer approved procedure.

Identify tire pressure monitoring systems (indirect and direct); calibrate system; verify operation of instrument panel lamps.

Demonstrate knowledge of steps required to remove and replace sensors in a TPMS including relearn procedure.

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

Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).

Hydraulic System

Describe proper brake pedal height, travel, and feel.

Check master cylinder for external leaks and proper operation.

Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports.

Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.

Identify components of hydraulic brake warning light system.

Bleed and/or flush brake system.

Test brake fluid for contamination.

Drum Brakes

Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.

Refinish brake drum and measure final drum diameter; compare with specification.

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.

Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.

Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; make final checks and adjustments.

Install wheel and torque lug nuts.

Disc Brakes

Remove and clean caliper assembly; inspect for leaks and damage/wear; determine necessary action.

Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action.

Remove, inspect, and/or replace brake pads and retaining hardware; determine necessary action.

Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads and inspect for leaks.

Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine necessary action.

Remove and reinstall/replace rotor.

Refinish rotor on vehicle; measure final rotor thickness and compare with specification.

Refinish rotor off vehicle; measure final rotor thickness and compare with specification.

Retract and readjust caliper piston on an integrated parking brake system.

Check brake pad wear indicator; determine necessary action.

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.
Notice of Non-Discrimination Policy
Virginia Beach City Public Schools does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation/gender identity, pregnancy, childbirth or related medical condition, disability, marital status, age, genetic information or veteran status in its programs and activities and provides equal access to the Boy Scouts and other designated youth groups. School Board policies and regulations (including, but not limited to, Policies 2-33, 4-4, 5-7, 5-19, 5-20, 5-44, 6-7, 6-33, 7-48, 7-49, 7-57 and Regulations 2-33.1, 4-4.1, 4-4.2, 4-4.3, 4-6.1, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, counseling services, physical education and athletic, vocational education, instructional materials and extracurricular activities.

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.

Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write The Department of Teaching and Learning, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038. Telephone 263-1070 (voice); fax 263-1424; 263-1240 (TDD) or email at Brandon.Martin@vbschools.com

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