VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

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
In this course, students explore, handle, and perform basic functions in engine repair, automatic transmission and transaxle, manual drive train and axles, suspension and steering systems, and brakes. Students who successfully complete the Automotive Technology program may be eligible to take the Automotive Service Excellence (ASE) Student Certification examination. The ASE Student Certification is the first step in building a career as a service professional in the automotive industry.

CERTIFICATION
Automotive Service Excellence Examinations (ASE)
ASE Entry Level Technician Examinations
Virginia Motor Vehicle Safety Inspection Program Examination
Environmental Protection Agency (EPA): Safety and Pollution Prevention 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 Personal Qualities and Abilities

1 Demonstrate creativity and innovation.
2 Demonstrate critical thinking and problem solving.
3 Demonstrate initiative and self-direction.
4 Demonstrate integrity.
5 Demonstrate work ethic.

Demonstrating Interpersonal Skills

6 Demonstrate conflict-resolution skills.
7 Demonstrate listening and speaking skills.
8 Demonstrate respect for diversity.
9 Demonstrate customer service skills.
10 Collaborate with team members.

Demonstrating Professional Competencies

11 Demonstrate big-picture thinking.
12 Demonstrate career- and life-management skills.
13 Demonstrate continuous learning and adaptability.
14 Manage time and resources.
15 Demonstrate information-literacy skills.
16 Demonstrate an understanding of information security.
17 Maintain working knowledge of current information-technology (IT) systems.
18 Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.
19 Apply mathematical skills to job-specific tasks.
20 Demonstrate professionalism.
21 Demonstrate reading and writing skills.
22 Demonstrate workplace safety.

Examining All Aspects of an Industry

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

Addressing Elements of Student Life

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

Exploring Work-Based Learning

35 Identify the types of work-based learning (WBL) opportunities.

36 Reflect on lessons learned during the WBL experience.
37 Explore career opportunities related to the WBL experience.
38 Participate in a WBL experience, when appropriate.

REQUIRED SUPPLEMENTAL TASKS

Lab/Shop and Personal Safety

39 Identify general lab/shop safety rules and procedures.
40 Utilize safe procedures for handling tools and equipment.
41 Identify and use proper placement of floor jacks and jack stands.
42 Identify and use proper procedures for safe lift operation.
43 Use proper ventilation procedures for working in the lab/shop area.
44 Identify marked safety areas.
45 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.
46 Identify the location and use of eye wash stations.
47 Identify the location of posted evacuation routes.
48 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
49 Identify and wear appropriate clothing for lab/shop activities.
50 Secure hair and jewelry for lab/shop activities.
51 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high-voltage circuits.
52 Demonstrate awareness of the safety aspects of high-voltage circuits such as high intensity discharge (HID) lamps, ignition systems, and injection systems.
53 Locate and demonstrate knowledge of safety data sheets (SDS).

Tools and Equipment

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

Preparing Vehicle for Service

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

Preparing Vehicle for Customer

64 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).

ENGINE REPAIR

General

65 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
66 Verify operation of the instrument panel engine warning indicators.

67 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
68 Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.

Lubrication and Cooling Systems

69 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.
70 Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.
71 Remove, inspect, and replace thermostat and gasket/seal.
72 Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.
73 Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required.

AUTOMATIC TRANSMISSION AND TRANSAXLE

General

74 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
75 Check fluid level in a transmission or a transaxle equipped with a dipstick.
76 Check fluid level in a transmission or a transaxle not equipped with a dipstick.
77 Check transmission fluid condition; check for leaks.
78 Identify drive-train components and configuration.

In-Vehicle Transmission/Transaxle

79 Inspect for leakage at external seals, gaskets, and bushings.
80 Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.

MANUAL DRIVE TRAIN AND AXLES

General

81 Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
82 Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.
83 Check fluid condition; check for leaks.

Clutch

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

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

86 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

87 Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.
88 Drain and refill differential housing.
89 Inspect and replace drive axle wheel studs.

SUSPENSION AND STEERING SYSTEMS

General

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

Related Suspension and Steering Service

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

Wheel Alignment

114 Perform pre-alignment inspection; measure vehicle ride height.
115 Describe alignment angles (camber, caster, and toe).

Wheels and Tires

116 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.
117 Rotate tires according to manufacturer’s recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).
118 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.
119 Dismount, inspect, and remount tire on wheel equipped with TPMS sensor.
120 Inspect tire and wheel assembly for air loss; determine necessary action.
121 Repair tire following vehicle manufacturer approved procedure.
122 Identify tire pressure monitoring systems (indirect and direct); calibrate system; verify operation of instrument panel lamps.
123 Demonstrate knowledge of steps required to remove and replace sensors in a TPMS including relearn procedure.

BRAKES

General

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

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

Hydraulic System

126 Describe proper brake pedal height, travel, and feel.

127 Check master cylinder for external leaks and proper operation.

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

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

130 Identify components of hydraulic brake warning light system.

131 Bleed and/or flush brake system.

132 Test brake fluid for contamination.

Drum Brakes

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

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

135 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.

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

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

138 Install wheel and torque lug nuts.

Disc Brakes

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

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

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

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

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

144 Remove and reinstall/replace rotor.

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

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

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

148 Check brake pad wear indicator; determine necessary action.

149 Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer’s recommendations.

Power-Assist Units

150 Check brake pedal travel with and without engine running to verify proper power booster operation.

151 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)

152 Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.
153 Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.
154 Check parking brake operation and parking brake indicator light system operation; determine necessary action.
155 Check operation of brake stop light system.
156 Replace wheel bearing and race.

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Produced by the Department of Teaching and Learning.
For further information, please call (757) 263-1070.

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, activities, employment, or enrollment, 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, 6-33, 6-7, 7-48, 7-49, 7-57 and Regulations 4-4.1, 4-4.2, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, enrollment, counseling services, physical education and athletic, vocational education, instructional materials, extracurricular activities and employment.

Title IX Notice: Complaints or concerns regarding discrimination on the basis of sex or sexual harassment should be addressed to the Title IX Coordinator, at the VBCPS Office of Student Leadership, 641 Carriage Hill Road, Suite 200, Virginia Beach, 23452, (757) 263-2020, Mary.Dees@vbschools.com (student complaints) or the VBCPS Department of School Leadership, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (757) 263-1088, Elizabeth.Bryant@vbschools.com (employee complaints). Additional information regarding Virginia Beach City Public Schools' policies regarding discrimination on the basis of sex and sexual harassment, as well as the procedures for filing a formal complaint and related grievance processes, can be found in School Board Policy 5-44 and School Board Regulations 5-44.1 (students), School Board Policy 4-4 and School Board Regulation 4-4.3 (employees), and on the School Division's website at Diversity, Equity and Inclusion/Title IX. 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, Plaza Annex/Family and Community Engagement Center, 641 Carriage Hill Road, Suite 200, Virginia Beach, VA 23452.

The School Division is committed to providing educational environments that are free of discrimination, harassment, and bullying. Students, staff, parents/guardians who have concerns about discrimination, harassment, or bullying should contact the school administration at their school. Promptly reporting concerns will allow the school to take appropriate actions to investigate and resolve issues. School Board Policy 5-7 addresses non-discrimination and anti-harassment, Policy 5-44 addresses sexual harassment and discrimination based on sex or gender. Policy 5-36 and its supporting regulations address other forms of harassment.

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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CITY PUBLIC SCHOOLS
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