CareerClusters™ PATHWAYS TO COLLEGE & CAREER READINESS
Transportation, Distribution & Logistics

Learning that works for Colorado CTE®

Colorado CTE Course – Scope and Sequence

Course Name	Automotive Service Technology I	Course Details Course = 0.50 Carnegie Unit Credit	Credit= 2.0 CTE Credential: CTE Transportation
Course Description	Automotive Service Technology (AST) prepares individuals to apply technical knowledge and skills to repair, service, and maintain all types of automobiles at an INTERMEDIATE level. This course builds on concepts learned in Auto Basic, MLR, and/ or Compact Engines. Students receive instruction on basic automobile maintenance requirements, specific tool uses and safety procedures. Inspection and repair of automotive systems is stressed in the areas of brakes, electrical, suspension, fuel, emissions and tune up procedures.		
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.		
SCED Identification #	20106	Schedule calculation based on 60 calendar days of a 90-day semester. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.	

All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at https://www.cde.state.co.us/standardsandinstruction/essentialskills

Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Career Development Skills		Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. Develop an education and career plan aligned with personal goals and employment in the automotive service industry. Understand and demonstrate	The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: (A) demonstrate knowledge of the technical knowledge and skills related to health and safety in the workplace such as wearing safety glasses and other personal protective equipment	Understand the certification requirements for the ASE Automobile and Light Truck Certification Series: • Engine Repair • Automatic Transmission/Transaxle • Manual Drive Train & Axels • Suspension & Steering • Brakes • Electrical/Electronic Systems • Heating & Air Conditioning • Engine Performance • Light Vehicle Diesel Engines	

		adherence to industry safety standards.	(PPE) and maintaining safety data sheets (SDS); (B) identify employment opportunities, including entrepreneurship opportunities and internships, and industry-recognized certification requirements for the field of automotive technology; (C) demonstrate the principles of group participation, team concept, and leadership related to citizenship and career preparation; (D) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the automotive technology industry; (E) discuss certification opportunities; (F) discuss response plans to emergency situations;	Maintain a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor. Cultivate positive leadership skills. Take part in opportunities to practice and demonstrate personal leadership skills. For example, taking advantage of opportunities provided by a career and technical student organization (CTSO), such as SkillsUSA. Assess situations, apply problem-solving techniques and decision-making skills within the school, community, and workplace. Participate as a team member in a learning environment. Respect the opinions, customs, and individual differences of others. Build personal career development by identifying career interests, strengths, and opportunities for employment and school work-based learning options.	

			(G) identify employers' expectations and appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills; and (H) develop personal goals, objectives, and strategies as part of a plan for future career and educational opportunities.		
Automotive service foundational employment skills		Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Transportation sector workplace environment.	The student relates core academic skills to the requirements of automotive technology. The student is expected to: (A) demonstrate effective written communication skills throughout the course, including documenting on a repair order customer concern/compliant, root cause of the failure, and corrective action to complete the repair; (B) estimate the cost of parts and labor operations on repair		

		Apply essential technical knowledge and skills common to all pathways in the Transportation sector, following procedures when carrying out experiments or performing technical tasks.	orders throughout the course, including the flat rate system; (C) demonstrate mathematical skills in performing addition, subtraction, multiplication, division, and measurements using decimals and fractions in the metric and U.S. standard systems as appropriate; and (D) research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.		
Automotive Service Foundations		Demonstrate understanding and applications of foundational knowledge for service and repairs in the automotive industry.	The student demonstrates the technical knowledge and skills that form the core of knowledge of automotive service. The student is expected to: (A) diagnose the major components of powered vehicles;	Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources. Test and analyze the elements of precision measuring using standard and metric systems. Demonstrate how to properly document maintenance and repair procedures in	SkillsUSA Automotive Service Competition

			(B) diagnose automotive chassis and driveline components; (C) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; (D) locate the manufacturer recommended preventative maintenance schedule; (E) perform a preventative maintenance inspection; (F) perform common fastener and thread repair, including removing broken bolt, restoring internal and external threads, and repairing internal threads with thread insert; (G) perform precision measurements and use published specifications to diagnose component	accordance with applicable rules, laws, and regulations (e.g., Bureau of Auto Repair [BAR] and Occupational Safety and Health Administration [OSHA]). Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.	

			wear and determine necessary repairs; and (H) employ critical-thinking skills and structured problem-solving skills to diagnose vehicle malfunctions, solve problems, and make decisions.		
Tools and Equipment		Use appropriate tools and equipment and perform necessary procedures to maintain, diagnose, service, and repair vehicle systems and components.	The student knows the functions and applications of the tools, equipment, technologies, and materials used in automotive technology. The student is expected to: (A) demonstrate the proper and safe use of hand and power tools and equipment commonly employed in the maintenance and repair of vehicles; (B) discuss and demonstrate the proper handling and disposal of environmentally hazardous materials used in servicing vehicles;	Recognize the importance of calibration processes, systems, and techniques using various measurement and testing devices. Demonstrate and use appropriate tools and equipment—such as wrenches, sockets, and pliers—to diagnose, service, repair, and maintain systems and components. Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic and air/pneumatic systems). Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance, and operation procedures.	

			(C) demonstrate proper use of diagnostic tools and equipment; and (D) locate, read, and interpret service repair information such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair bulletins.	Use measurement scales, devices, and systems, such as dial indicators and micrometers, to design, fabricate, diagnose, maintain, and repair vehicles and components following recommended industry standards.	
Brakes		Understands and applies knowledge of automotive vehicle braking systems and components.	The student applies the technical knowledge and skills related to brakes in simulated or actual work situations. The student is expected to: (A) describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS); (B) measure brake pedal height, reserve distance, travel, and free play; (C) identify components of brake warning light system; (D) bleed and flush brake system;	Demonstrate ASE performance Indicators: See ASE Test and Specifications Task Lists	

			(E) identify and check the operation of brake stop light system; and (F) identify traction control and vehicle stability control system components.		
Electrical		Understands and applies knowledge of automotive vehicle electrical systems and components.	The student applies the technical knowledge and skills related to electrical systems in simulated or actual work situations. The student is expected to: (A) demonstrate knowledge of the causes and effects from shorts, opens, and resistance in electrical/electronic circuits; (B) measure key-off battery drain/parasitic draw; (C) perform solder repair of electrical wiring; (D) replace electrical connectors and terminal ends;	Demonstrate ASE performance Indicators: See ASE Test and Specifications Task Lists	

			(E) demonstrate the ability to maintain or restore electronic memory functions; (F) perform slow and fast battery charges according to manufacturer recommendations; (G) identify electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting a vehicle battery; (H) perform starter current draw test and starter circuit voltage drop tests and inspect and test starter relays and solenoids; (I) remove and install a starter in a vehicle; (J) inspect and test switches, connectors, and wires of starter control circuits; (K) perform charging system output test;		

			(L) remove, inspect, and re-install alternator; (M) identify system voltage and safety precautions associated with high-intensity discharge headlights; (N) disable and enable airbag system for vehicle service and verify indicator lamp operation; (O) remove and reinstall a door panel; and (P) describe the operation of keyless entry and remote-start systems.		
Suspension & Steering		Understands and applies knowledge of automotive vehicle suspension and steering systems and components.	The student applies the technical knowledge and skills related to suspension in simulated or actual work situations. The student is expected to: (A) inspect and replace power steering hoses and fittings; (B) remove, clean, inspect, repack, and	Demonstrate ASE performance Indicators: See ASE Test and Specifications Task Lists	

			install wheel bearings; replace seals; install hubs; and adjust bearings; (C) replace wheel bearing and race; (D) disable and enable supplemental restraint system (SRS); (E) inspect, remove, and replace shock absorbers and struts and inspect mounts and bushings; (F) dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system (TPMS); (G) inspect rear suspension system lateral links/arms, trailing arms, leaf springs, spring insulators, shackles, brackets, center pins, and mounting bolts; (H) inspect tire condition and wear patterns, check for correct size and application based on		

			load and speed rating, and adjust air pressure; (I) perform pre-alignment inspection and measure vehicle ride height; (J) inspect tire and wheel assembly for air loss; (K) identify and test indirect and direct TPMSs and operation of the instrument panel lamps; (L) demonstrate knowledge of steps required to remove and replace sensors in a TPMS; and (M) inspect, remove, and replace front wheel drive (FWD) bearings, hubs, seals, shafts, boots, and universal/constant velocity (CV) joints.		
