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 III	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. This course is designed to expand the knowledge and skills that the student achieved in Automotive Technology II. This course focuses on the removal and installation procedures of the automotive engine from and into front wheel and rear wheel drive vehicles. The students will have lecture and laboratory experiences in the disassembly, diagnosis and reassembly of the automotive engine. Topics include the diagnostic and repair procedures for the engine block and head assemblies. Students will continue to receive instruction in other ASE areas to continue to prepare them for the ASE certification exams.		
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	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	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	

		automotive service industry. Understand and demonstrate adherence to industry safety standards.	workplace such as wearing safety glasses and other personal protective equipment (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;	• Engine Performance • Light Vehicle Diesel Engines 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.	

			(E) discuss certification opportunities; (F) discuss response plans to emergency situations; (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	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		

		new information, as required in the Transportation sector workplace environment. Apply essential technical knowledge and skills common to all pathways in the Transportation sector, following procedures when carrying out experiments or performing technical tasks.	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 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	The student demonstrates the technical knowledge and skills that form the	Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.	SkillsUSA Automotive Service Competition

		for service and repairs in the automotive industry.	core of knowledge of automotive service. The student is expected to: (A) diagnose the major components of powered vehicles; (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	Test and analyze the elements of precision measuring using standard and metric systems. Demonstrate how to properly document maintenance and repair procedures in 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.	

			repairing internal threads with thread insert; (G) perform precision measurements and use published specifications to diagnose component 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	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	

			the maintenance and repair of vehicles; (B) discuss and demonstrate the proper handling and disposal of environmentally hazardous materials used in servicing vehicles; (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.	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. 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.	
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	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	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	

		automotive service industry. Understand and demonstrate adherence to industry safety standards.	health and safety in the workplace such as wearing safety glasses and other personal protective equipment (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;	• Heating & Air Conditioning • Engine Performance • Light Vehicle Diesel Engines 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.	

			(E) discuss certification opportunities; (F) discuss response plans to emergency situations; (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.		
Engine Repair		Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems. Perform general engine maintenance, diagnosis, service, and repair in accordance with	The student applies the technical knowledge and skills related to engines in simulated or actual work situations. The student is expected to: (A) install engine covers using gaskets, seals, and sealers as required;	Demonstrate ASE performance Indicators: See ASE Test and Specifications Task Lists	

		portable national industry standards, such as the National Automotive Technicians Education Foundation (NATEF) and the Equipment and Engine Training Council (EETC).	(B) remove and replace timing belt and verify correct camshaft timing; (C) perform cooling system pressure and dye tests to identify leaks, check coolant condition and level, and inspect and test radiator, pressure cap, coolant recovery tank, and heater core; and (D) remove, inspect, and replace thermostat and gasket or seal.		
Automatic Transmission/Transaxle Manual Drive Train & Axels		Understand and apply proficiently the diagnosis, service, repair and overhaul of automatic transmissions/transaxles. Understand and apply proficiently the operation, assembly, diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, rear axle differential assembly,	The student applies the technical knowledge and skills related to manual and automatic drive train and axles in simulated or actual work situations. The student is expected to: (A) identify the different fluid types used in both an automatic and manual transmission/transaxle;	Demonstrate ASE performance Indicators: See ASE Test and Specifications Task Lists	

		limited slip, four-wheel drive and all-wheel drive.	(B) identify the fluid types and capacity required by application using service information; (C) check fluid level in a transmission or a transaxle equipped with a dip-stick; (D) check fluid level in a transmission or a transaxle not equipped with a dip-stick; (E) check fluid condition and inspect for leaks; (F) drain and replace fluid and filter or filters in an automatic transmission/transaxle; (G) drain and replace fluid in an manual transmission/transaxle; and (H) inspect power train mounts.		
