

Automotive Technology

Unit Focus

Students in this course will be introduced to the basics of safety, equipment identification and use, engine operation, vehicle system fundamentals, vehicle maintenance and shop operation. This course allows students to experience a variety of automotive practices through both demonstrations and instruction within engine theory, repair and maintenance. Students learn of the varied careers available within the automotive industry. Engine design and construction are discussed and studied. Students will receive experience with automotive repairs and diagnosis. The PBA will have students perform a safety inspection on an automobile and determine what type of service/repair is needed.

Stage 1: Desired Results - Key Understandings

Standard(s)

Transfer

Connecticut Goals and Standards

Automotive Technology: 12

- Demonstrate knowledge of proper use, storage, and disposal of hazardous materials for an automotive facility according to OSHA regulations.*(B4) *AUTO.01.02*
- Describe a safe working environment for both employees and the shop environment. *AUTO.01.04*
- Demonstrate and explain knowledge of personal safety practices such as eyewear, clothing, footwear, and personal protective equipment (PPE).*(B5) *AUTO.01.05*
- Demonstrate and explain knowledge of shop safety procedures when performing tasks, such as raising a vehicle with a floor jack.*(B6) *AUTO.01.06*
- Identify basic hand tools and their usage in the automotive industry.*(B7) *AUTO.01.07*
- Demonstrate the operating principles of internal and external combustion engines *AUTO.03.01*
- Describe basic valve train operation and configuration, such as DOHC, SOHC, OHV, and flathead.*(C8) *AUTO.03.02*
- Describe basic engine cylinder configurations such as V, inline, and horizontally opposed.*(C9) *AUTO.03.03*
- Identify and describe the function of the basic engine components.*(C10) *AUTO.03.04*
- Describe principles of pneumatic and hydraulic power and their applications. *AUTO.03.05*
- Describe the purpose, operation, and basic components of lubrication systems.*(C13) *AUTO.03.06*
- Describe the purpose, operation, and basic components of engine cooling

T1 Explore and hone techniques, skills, methods, and processes to create and innovate.
T2 Demonstrate professionalism through exhibiting attentiveness, growing from feedback, and adhering to industry standards (safety).

Meaning

Understanding(s)

Essential Question(s)

U1 Proper use of tools and equipment is necessary for successful maintenance and repair.
U2 Failure to understand and maintain one particular system in a vehicle can have adverse effects on one or more of the vehicle's other systems.
U3 Proper vehicle maintenance is critical to vehicle longevity, performance and economy.
U4 Both the tools I am using and the way I am using them impact the quality of the result, the safety of the shop environment, and the longevity of the equipment.

Q1 When maintaining or servicing a vehicle, how do I determine which safety rules need to be adhered to?
Q2 How do the automotive systems interact with each other during the basic operation and maintenance of a vehicle?
Q3 Why is an understanding of proper tool use necessary for successful repair?
Q4 How do my behaviors and actions affect the safety of myself and others?

Stage 1: Desired Results - Key Understandings

<p>systems.*(C14)</p> <ul style="list-style-type: none"> • Illustrate principles of electricity, electronics and electrical power generation, and distribution systems. <i>AUTO.03.07</i> • Differentiate between the 4-stroke and 2-stroke operating cycles.*(C11) <i>AUTO.03.08</i> • Differentiate between spark ignition and compression ignition engines.*(C12) <i>AUTO.03.09</i> • Perform necessary procedures to maintain, diagnose, service, and repair vehicle systems and malfunctions. <i>AUTO.03.10</i> • Complete a work order, including customer information, description of repairs, and billing information, in accordance with applicable rules, laws, and regulations. <i>AUTO.04.05</i> • Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards. <i>AUTO.05.01</i> • Maintain, diagnose, service, and repair lubrication and cooling systems. <i>AUTO.05.02</i> • Describe and demonstrate the process for performing exhaust inspection and service. <i>AUTO.05.04</i> • Describe the purpose, operation, and basic components of the steering system.*(F28) <i>AUTO.08.01</i> • Identify factors that cause abnormal tire wear.*(E31) <i>AUTO.08.04</i> <p>ITEEA - Standards for Technological Literacy <i>Technological Literacy: K-12</i></p> <ul style="list-style-type: none"> • Students will develop an understanding of the characteristics and scope of technology. <i>1</i> • Students will develop an understanding of and be able to select and use transportation technologies. <i>18</i> <p>Student Growth and Development 21st Century Capacities Matrix <i>Critical Thinking</i></p> <ul style="list-style-type: none"> • Analyzing: Students will be able to examine information/data/evidence to make inferences and identify possible underlying assumptions, patterns, and relationships. <i>MM.1.2</i> • Synthesizing: Students will be able to thoughtfully combine information/data/evidence, concepts, texts, and disciplines to draw conclusions, create solutions, and/or verify generalizations for a given purpose. <i>MM.1.3</i> <p><i>Self-Direction</i></p> <ul style="list-style-type: none"> • Perseverance: Students will be able to identify problem(s) and use appropriate strategies to continue toward a desired goal. <i>MM.4.2</i> 	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<p>K1 Measurement tools: calipers, tire tread depth gauge, dial indicator, steel rule, torque wrench, feeler gauge, temperature, pressure gauge, vacuum gauge, compression tester, multi-meter, battery load tester and diagnostic code reader.</p> <p>K2 Parts, assemblies & systems: frame/body/chassis, engine, computer system, fuel system, electrical system, cooling & lubrication system, exhaust & emission control system, drivetrain system and parts, suspension, steering and brake systems and accessories & safety systems.</p> <p>K3 Identify and safely use common automotive hand, power and air tools as well as shop equipment and describe their uses.</p>	<p>S1 Locate and inspect primary automotive systems and assemblies of a passenger vehicle.</p> <p>S2 Use a variety of measurement tools and diagnostic equipment to test and evaluate parts that require repair, replacement or adjustment.</p> <p>S3 Safely use a hydraulic lift to raise a vehicle for inspection and/or service.</p> <p>S4 Safely use a variety of hand tools, power tools and shop equipment in the service of a passenger vehicle.</p> <p>S5 Inspect the internal components and operation of an engine through disassembly/assembly.</p> <p>S6 Complete an oil & filter maintenance for a passenger vehicle.</p>