



Course Outcome Summary

Course Information: **Introduction to Automotive Technology**

Description: This is the first of two courses for those students interested in working in the automotive industry. This course includes three areas: 1. automotive shop and environmental safety practices are introduced and safety sheets are signed. 2. Parts room procedures to introduce the functions of the parts sector in relation to the automotive technology field including parts systems, parts research and online parts catalogs. 3. Automotive related instruction which includes gas metal arc welding and oxy fuel cutting and heating.

Instruction Level: **Grades 10-12**

Total Credits: **1 (3 Transcribed)**

Course Standards:

ACT College and Career Readiness Standards

- Show competent use of language to communicate ideas
- Locate and interpret minor or subtly stated details in complex passages
- Analyze and draw conclusions based on a set of conditions
- Interpret words and phrases as they are used in complex passages, including determining technical, connotative, and figurative meanings
- Draw logical conclusions using information from two informational texts

CTE Common Core Standards

- Students will communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Students will identify and apply employability skills
- Students will assess the benefits and challenges of working in diverse settings and on diverse teams
- Students will apply leadership skills in real-world, family, community and business and industry applications.

Career and Technology Standards

- Identify how governmental regulations and technological trade-offs might influence the transportation modes used to move people and goods from one place to another.
- Recognize that transportation vehicles need to be cared for in order to prolong their useful life.
- Explain that transportation vehicles have multiple components with different functions.
- Predict how a lack of maintenance can lead to degradation and premature failure.

- Identify that a transportation system may lose efficiency or fail if one part is missing or malfunctioning or if a subsystem is not properly working.
- Interpret preventive maintenance schedules and recommended service intervals for vehicles.
- Explain that all systems demand specific repair procedures in order to achieve highest performance and efficiency.
- Operate transportation-related tools and equipment in a safe manner.
- Students will perform tasks related directly to current national standards per transportation area (i.e., NATEF).
- Demonstrate safe and proficient use of specialty tools and equipment related to servicing transportation vehicles.
- Explain career preparation, career pathways and the importance of on-the-job training as well as further education with regard to the transportation field.

Unit

1. **Safety**
2. **Visual Inspections**
3. **Service Information**
4. **Vehicle Systems and Parts**
5. **Tires and Balancing**
6. **Automotive Metalworking**
7. **Thread and Fastener Repair**

Unit Outlines

1. Safety

Standards:

- Operate transportation-related tools and equipment in a safe manner.
- Demonstrate safe and proficient use of specialty tools and equipment related to servicing transportation vehicles.
- Identify how governmental regulations and technological trade-offs might influence the transportation modes used to move people and goods from one place to another.
- Recognize that transportation vehicles need to be cared for in order to prolong their useful life.
- Explain that transportation vehicles have multiple components with different functions.

Essential Question:

Students will be able to answer the question(s):

- What standard safety rules should anyone servicing or maintaining vehicles understand and adhere to?
- Why is an understanding of proper tool use necessary for successful repair?

Essential Knowledge:

- The student will be able to explain the importance of personal safety in the shop and how to contribute to overall shop safety when working with others.
- Describe and properly use Personal Protective Equipment (PPE).
- Demonstrate safe use of hand and power tools.
- Identify hazardous materials and understand how to read a standard Material Safety Data Sheet (MSDS).
- Explain the basic processes and procedures for maintaining a clean, safe and customer-friendly shop.
- Describe processes for handling and disposing of hazardous waste adhering to environmental requirements.
- Know what safety precautions are needed when changing the battery of a car.
- Know what must be done to long hair, dangling jewelry and loose clothing before working on cars.
- Demonstrate and be able to explain proper eye safety
- Be able to locate the closest fire alarm in the automotive shop.
- Be able to locate the fire extinguishers in the automotive shop.
- Be able to locate the fire blanket in the automotive shop.
- Understand the importance of pressure on a wound and signs of shock if someone is severely bleeding from a laceration.
- Know what to do if someone's clothes caught on fire.
- Understand the dangers of using incandescent lights when working underneath a vehicle.
- Know the type of fire extinguisher used to control a gasoline spill fire.
- Understand the advantages and dangers when using compressed air.
- Know the proper handling of sharp or pointed tools.
- Know the precautions that should be taken prior to removing a radiator cap.
- Know the precautions that should be taken when using aerosol or pump chemicals.
- Understand why "Disconnect the negative battery terminal" is often the first procedure for most repairs.

2. Visual Inspections

Standards:

- Recognize that transportation vehicles need to be cared for in order to prolong their useful life.
- Explain that transportation vehicles have multiple components with different functions.

Essential Question:

Students will be able to answer the question(s):

- What role does accurate repair and maintenance records play in efficient and timely repairs?
- What role does accurate repair and maintenance records play in preserving the value of a vehicle?

Essential Knowledge:

- Understand the role clear written communication plays in an automotive repair shop.
- Complete a specification sheet for their family vehicle.
- Complete an under-hood inspection sheet.
- Complete an under-lift inspection sheet.

3. Service Information

Standards:

- Describe the purpose and use of owner's manuals.
- Describe the purpose and use of shop manuals/service information.
- Explain how TSBs are used.
- Explain how service campaigns and recalls are used.
- Describe the purpose and use of labor guides.
- Describe the purpose and use of service history.
- Operate transportation-related tools and equipment in a safe manner.
- Students will perform tasks related directly to current national standards per transportation area (i.e., NATEF).

Essential Question:

Students will be able to answer the question(s):

- What role does accurate repair and maintenance records play in efficient and timely repairs?
- What role does accurate repair and maintenance records play in preserving the value of a used vehicle?

Essential Knowledge:

- Identify a vehicle using its Vehicle Identification Number (VIN)
- Know where to locate the VIN number
- Locate and use online service information
- Locate and use service information from a service manual
- Complete a service work order accurately and completely
- Understand and use the 'three C's': concern, cause, correction.

4. Vehicle Systems and Parts

Standards:

- Explain that transportation vehicles have multiple components with different functions.
- Describe the components and functions of the various systems that must be serviced to enhance reliability and preserve value.
- Predict how a lack of maintenance can lead to degradation and premature failure.
- Identify that a transportation system may lose efficiency or fail if one part is missing or malfunctioning or if a subsystem is not properly working.
- Students will perform tasks related directly to current national standards per transportation area (i.e., NATEF).

Essential Question:

Students will be able to answer the question(s):

- What systems are found in today's vehicles and how do they function?
- How have vehicles changed over the past century?
- How do vehicle subsystems communicate with each other, how are they integrated?

Essential Knowledge:

- Locate external engine components on multiple vehicles.
- Remove wheels to rotate tires, inspect suspension components and evaluate brakes.
- Use a torque wrench to tighten lug nuts accurately.
- Replace windshield wipers.
- Check and top off vital fluids.

5. Tires and Balancing**Standards:**

- Predict how a lack of maintenance can lead to degradation and premature failure.
- Identify that a transportation system may lose efficiency or fail if one part is missing or malfunctioning or if a subsystem is not properly working.
- Interpret preventive maintenance schedules and recommended service intervals for vehicles.
- Operate transportation-related tools and equipment in a safe manner.
- Students will perform tasks related directly to current national standards per transportation area (i.e., NATEF).
- Demonstrate safe and proficient use of specialty tools and equipment related to servicing transportation vehicles.

Essential Question:

Students will be able to answer the question(s):

- How do tires affect safety and performance?

Essential Knowledge:

- Know how friction contributes to vehicle performance in varying weather conditions.
- Know the criteria for an excellent tire.
- Inspect tires, adjust pressure, rotate tires for even wear, and understand uni-directional configuration.
- Understand how tires affect vehicle performance.
- Understand how tires affect driving safety.
- Understand tire sidewall information.
- Identify where accurate information concerning tire pressure can be located.

6. Automotive Metalworking**Standards:**

- Operate transportation-related tools and equipment in a safe manner.

- Students will perform tasks related directly to current national standards per transportation area (i.e., NATEF).
- Demonstrate safe and proficient use of specialty tools and equipment related to servicing transportation vehicles.

Essential Question:

Students will be able to answer the question(s):

- What is the best method for joining exhaust pipe together?
- What is the best/most efficient way to remove a stuck/damaged fastener?

Essential Knowledge:

- Setup MIG welder for specific metal thickness
- Setup MIG welder for specific exhaust pipe
- Weld mild steel with MIG welder
- Weld exhaust pipe with MIG welder
- Setup plasma cutter to accommodate material thickness
- Utilize plasma cutting process
- Setup oxy/acetylene torch
- Utilize oxy/acetylene torch to cut mild steel
- Utilize oxy/acetylene torch to heat specified material

7. Thread and Fastener Repair

Standards:

- Operate transportation-related tools and equipment in a safe manner.
- Students will perform tasks related directly to current national standards per transportation area (i.e., NATEF).
- Demonstrate safe and proficient use of specialty tools and equipment related to servicing transportation vehicles.

Essential Question:

Students will be able to answer the question(s):

- What are common tools and equipment used in thread and fastener repair?
- Why is an understanding of proper tool use necessary for successful thread or fastener repair?
- Describe the various processes used to perform thread and fastener repair.

Essential Knowledge:

- Demonstrate understanding of fastener nomenclature.
- Utilize proper thread dressing.
- Describe and use a thread gauge
- Understand that using the right tool for the job will result in successful thread repairs.
- Understand the role clear written communication plays in an automotive repair shop.
- Demonstrate setting up and use of a oxy-acetylene torch.
- Demonstrate proper use of a drill press

- Demonstrate proper installation of a heli-coil
- Demonstrate proper use of a punches, chisels and drifts

