

Western Technical College

32404302 Introduction to Automotive Technology

Course Outcome Summary

Course Information

Description	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.
Career Cluster	Transportation, Distribution and Logistics
Instructional Level	Technical Diploma Courses
Total Credits	3
Total Hours	108

Textbooks

Fundamentals of Automotive Technology. 2nd Edition. Copyright 2018. CDX Automotive. Publisher: Jones & Bartlett Publishers. **ISBN-13:** 978-1-2842-0995-5. Required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** To be discussed in class. Required.

Welding sateen jacket, welding work gloves, welding helmet - \$80.00. **Vendor:** To be discussed in class. Required.

Six inch ankle high, quality leather work shoes - \$75.00-100.00. **Vendor:** To be discussed in class. Required.

Pocket knife, six inch metal pocket ruler (English/metric measurement), small pocket flashlight, and pocket flat head screwdriver - \$20.00. **Vendor:** To be discussed in class. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Live Responsibly: Embrace Sustainability
3. Live Responsibly: Foster Accountability
4. Refine Professionalism: Participate Collaboratively

5. Refine Professionalism: Practice Effective Communication

Program Outcomes

1. Demonstrate professionalism appropriate for the auto service industry.
2. Perform diagnosis, service, and repair of automotive internal combustion engines.
3. Perform diagnosis, service, and repair of automotive automatic transmission/transaxle systems.
4. Perform diagnosis, service, and repair of automotive manual drive train and axle systems.
5. Perform diagnosis, service, and repair of automotive steering and suspension systems.
6. Perform diagnosis, service, and repair of automotive brake systems.
7. Perform diagnosis, service, and repair of automotive electrical and electronic systems.
8. Perform diagnosis, service, and repair of automotive heating and air conditioning systems.
9. Perform diagnosis, service, and repair of automotive engine performance systems.

Course Competencies

1. Demonstrate personal safety.

Assessment Strategies

- 1.1. Online Evaluation
- 1.2. Instructor Observation

Criteria

You will know you are successful when:

- 1.1. you complete online evaluation by due date.
- 1.2. you comply with required safety standards at all times.
- 1.3. you wear proper personal protective equipment (PPE).
- 1.4. you demonstrate proper use and location of safety equipment in all work environments.

Learning Objectives

- 1.a. Comply with required use of safety glasses, ear protection, gloves, and boots during shop activities
- 1.b. Identify and wear appropriate clothing for shop activities
- 1.c. Secure hair and jewelry for shop activities
- 1.d. Identify general shop safety rules and procedures
- 1.e. Utilize proper ventilation procedures for working within shop area
- 1.f. Identify marked safety areas
- 1.g. Identify the location and types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedure for using fire extinguishers and other fire safety equipment
- 1.h. Identify the locations of emergency shut off switches
- 1.i. Identify the location and use of eye wash and shower stations
- 1.j. Identify the location of the posted evacuation routes
- 1.k. Identify high-voltage circuits of electric and hybrid electric vehicle and related safety precautions
- 1.l. Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits
- 1.m. Demonstrate awareness of safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injections systems, etc.)
- 1.n. Locate and demonstrate knowledge of safety data sheets(SDS)

2. Identify proper use of hand tools.

Assessment Strategies

- 2.1. Instructor Observation

Criteria

You will know you are successful when:

- 2.1. you maintain tools and facilities in good condition.
- 2.2. you judge which tool and procedure will produce the desired results.
- 2.3. you demonstrate correct use of hand tools.
- 2.4. you comply with best industry practices for each tool you operate.

Learning Objectives

- 2.a. Identify tools and their usage in automotive applications
- 2.b. Demonstrate safe handling of appropriate tools
- 2.c. Utilize safe procedures for using tools
- 2.d. Demonstrate proper cleaning, storage and maintenance of tools
- 2.e. Identify standard and metric designations
- 2.f. Perform inventory of assigned tool box and maintain in compliance with tool box lending program

3. Identify proper use of pneumatic and electric tools.

Assessment Strategies

- 3.1. Instructor Observation

Criteria

You will know you are successful when:

- 3.1. you maintain tools and facilities in good condition.
- 3.2. you judge which tool and procedure will produce the desired results.
- 3.3. you demonstrate correct use of pneumatic tools.
- 3.4. you demonstrate correct use of electric tools.
- 3.5. you comply with best industry practices for each tool you operate.

Learning Objectives

- 3.a. Operate air valves and controls
- 3.b. Identify tools and their usage in automotive applications
- 3.c. Demonstrate safe handling of appropriate tools
- 3.d. Utilize safe procedures for operating tools
- 3.e. Demonstrate proper cleaning, storage and maintenance of tools

4. Demonstrate safe and proper use of shop equipment.

Assessment Strategies

- 4.1. Skill Demonstration

Criteria

You will know you are successful when:

- 4.1. you select the correct tools and equipment.
- 4.2. you perform all critical steps in the right order
- 4.3. you position yourself correctly
- 4.4. you employ manufacturer specific lifting process.
- 4.5. you wear personal protective equipment
- 4.6. you follow safety procedures
- 4.7. you maintain equipment and facilities in good condition.

Learning Objectives

- 4.a. Identify common automotive equipment and uses
- 4.b. Identify and use proper placement of floor jacks and jack stands
- 4.c. Identify and use proper procedures for safe lift operation
- 4.d. Utilize safe procedures for handling/using equipment
- 4.e. Demonstrate proper cleaning, storage, and maintenance of equipment
- 4.f. Recognize overhead door safety and controls

5. Prepare vehicle for service and return.

Assessment Strategies

- 5.1. Instructor Observation
- 5.2. Written Product

Criteria

You will know you are successful when:

- 5.1. you follow prescribed format, meeting criteria for all components, on the work order.
- 5.2. you use floor mats, steering wheel cover, seat cover, fender covers and wheel chocks.
- 5.3. you complete the work order with clear purpose.

Learning Objectives

- 5.a. Identify information needed and the service requested on a repair order.
- 5.b. Identify purpose and demonstrate proper use of fender covers/mats.
- 5.c. Demonstrate use of the three C's (concern, cause, and correction).
- 5.d. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
- 5.e. Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).

6. Access vehicle service information.

Assessment Strategies

- 6.1. Skill Demonstration

Criteria

You will know you are successful when:

- 6.1. you find applicable vehicle information.
- 6.2. you find applicable service procedures.
- 6.3. you find applicable service precautions.
- 6.4. you find applicable technical service bulletins.

Learning Objectives

- 6.a. Review vehicle service history.
- 6.b. Demonstrate use of vehicle service information systems.

7. Identify vehicle systems and parts.

Assessment Strategies

- 7.1. Written Objective Test
- 7.2. Skill Demonstration

Criteria

You will know you are successful when:

- 7.1. you identify brake parts.
- 7.2. you identify exhaust parts.
- 7.3. you identify steering and suspension parts.

Learning Objectives

- 7.a. Identify vehicle system components.

8. Perform general vehicle inspection.

Assessment Strategies

- 8.1. Skill Demonstration

Criteria

You will know you are successful when:

- 8.1. you check all interior and exterior lights.
- 8.2. you check all fluid levels.
- 8.3. you check basic suspension parts.
- 8.4. you check exhaust.

- 8.5. you perform visual brake inspection.
- 8.6. you check tire tread depth and tire pressure.
- 8.7. you inspect windshield and wiper condition.

Learning Objectives

- 8.a. Complete a general vehicle inspection form.

9. Demonstrate proper use of metal working equipment.

Assessment Strategies

- 9.1. Skill Demonstration

Criteria

You will know you are successful when:

- 9.1. you select the correct welding, cutting, and heating equipment including PPE.
- 9.2. you prepare the welding, heating, and cutting equipment.
- 9.3. you employ proper heating technique.
- 9.4. you employ proper cutting technique.
- 9.5. you employ proper welding technique.

Learning Objectives

- 9.a. Identify the correct PPE for welding and grinding
- 9.b. Prepare MIG welder for specified mild steel thickness
- 9.c. Prepare MIG welder for specified exhaust pipe
- 9.d. Weld mild steel with a sound bead using a MIG welder
- 9.e. Weld exhaust pipe with a sound bead using a MIG welder
- 9.f. Analyze the cause and make corrections for unsound welds
- 9.g. Prepare plasma cutter to accommodate material thickness
- 9.h. Utilize plasma cutting process
- 9.i. Prepare oxy/acetylene torch for heating or cutting
- 9.j. Utilize oxy/acetylene torch to cut through mild steel
- 9.k. Utilize oxy/acetylene torch to heat specified material

10. Perform common fastener and thread repair.

Assessment Strategies

- 10.1. Demonstration

Criteria

You will know you are successful when:

- 10.1. you drill three holes to tolerances in mild steel.
- 10.2. you tap one hole to fit a specific size bolt (internal thread repair).
- 10.3. you tap one hole to fit a specific size bolt, cut bolt and extract remaining portion.
- 10.4. you tap one hole to fit a specific size and install thread insert.
- 10.5. you repair external threads with a die (external thread repair).

Learning Objectives

- 10.a. Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.