



# Walker Career Center

## Automotive Service Capstone

DOE# 7375



### Course Description and Outline

This course further explores important skills and competencies within the Automotive Service Technology Pathway. Topics such as Steering & Suspension, Engine Repair, Climate Control, and Driveline Service. Additionally, Co-Op and Internship opportunities will be available for students.

### Teacher Information and Student Supports

**Name:** Dale Bupp  
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**Phone:** 317-532-6180

#### Course Supplies

- Online Textbook
- Work Shoes
- Work Clothes

#### Additional Supports

- Reteach and Enrichment activities in class every Thursday
- Individual help by appointment when necessary

### *Journey of a Graduate Skills*

#### Critical Thinking

- Diagnose fuel and ignition faults.
- Diagnose inputs and outputs.
- Diagnose OBD II system fault codes and determine repair needed.
- Determine if OBD II monitors have executed.
- Identify tools used for common engine repair.
- Identify engine configurations.
- Inspect cylinder long block components and determine needed repairs.
- Identify tools and equipment used in climate control systems.
- Identify all components of the heating and air conditioning system.

#### Communication

- Explain four-stroke cycle fundamentals and volumetric efficiency.
- Identify and explain the operation of fuel injection systems.
- Identify and explain operation of ignition systems.
- Identify and explain operation of vehicle emission systems.
- Identify and explain operation of sensors and actuators.
- Describe the major engine operating systems and their function. Identify engine configurations.
- Describe the function of the OBD II Monitors.
- Describe the major engine operating systems and their functions.
- Describe engine components and their functions.
- Describe engine lubricants and sealing systems.
- Describe fasteners and torque requirements and procedures.
- Describe and explain analog and digital signals.
- Explain and diagnose body modules and their functions.
- Explain Hybrid Electrical systems and their operation.
- Explain/demonstrate Hybrid vehicle service safety precautions.
- Explain and diagnose advanced automotive systems and networks.
- Explain the purpose and function of the heating and air conditioning systems.
- Explain refrigeration theory.
- Explain hybrid climate control system operation.

**Resilience**

- Attain readiness to take the VERUS Navigation and Scanner Certification exam.
- Attain readiness to take Snap-On Torque Electrical Certification exam.
- Attain readiness to take Snap-On Torque Mechanical Certification exam.
- Utilize scan tools, lab scopes, and other electronic diagnostic equipment.

**Collaboration**

- Students will work together to diagnose service and repair electrical/electronic system faults.
- Students will work together to diagnose service and repair heating and air conditioning components.
- Students will work together to diagnose automatic and manual climate control systems.

**Content Knowledge**

- Retrieve DTC's and freeze frame data with a scan tool.
- Demonstrate basic engine diagnosis including compression and leak down testing.
- Demonstrate knowledge of computer sensors and inputs.
- Demonstrate knowledge of computer actuators and outputs.
- Properly install camshaft and timing chain(s) and/or belts.
- Disassemble and reassemble engines to industry standards.
- R & R engine assembly.
- Demonstrate knowledge of wiring and circuit diagrams.
- Demonstrate knowledge of voltage, current, and resistance measurements using meters and scopes.
- Demonstrate the ability to diagnose automotive circuits using electrical schematics.
- Recover and recycle refrigerants using approved equipment.
- Demonstrate knowledge of automatic climate control systems.

**Citizenship**

- Demonstrate proper shop safety practices while in the labs.
- Demonstrate proper handling of refrigerants.

**Grade Calculation*****MSD Warren Township Scale***

Grade	Percentage
A	92.5 - 100
A-	89.5 - 92.4
B+	86.5 - 89.4
B	82.5 - 86.4
B-	79.5 - 82.4
C+	76.5 - 79.4
C	72.5 - 76.4
C-	69.5 - 72.4
D+	66.5 - 69.4
D	62.5 - 66.4
D-	59.5 - 62.4
F	Below 59.5

**Credits/Pathways****CORE 40 Diploma**

Course fulfills two credits of the elective requirement for the Core 40 diploma.

**Academic/Technical Honors Diploma**

Has potential to fulfill academic/technical honors diploma. - see counselor

***CTE Graduation Pathway***

***Recommended – Intro to Transportation***

***Principles – Principles of Automotive Services***

***Course A – Brake Systems***

***Course B – Steering and Suspension***

***Capstone – Automotive Service Capstone***

## **Grading Policies**

### **Semester Grade**

Your semester grade will be calculated in the following way:

50% Assessments (Tests, Quizzes, Projects)

40% Labs, Homework and other assignments

10% Final Project

### **Warren Central Grading Policy**

The high school grading policies will be explained here

### **Warren Central Homework Policy**

The high school homework policies will be explained here.

### **Synergy Grades**

Grades posted in Synergy reflect the students' academic performance in the course.

## **Types of Assignments and Assessments**

### **Assignments**

Assignments will include classwork, homework, labs, and bell work. These items are opportunities for students to practice the concepts learned in class.

### **Labs**

Each unit will have one or more laboratory experiments. Labs are designed to demonstrate "real world" applications of the class concepts and help students develop a deeper understanding of the learning objectives.

### **Assessments**

Tests/projects cover Indiana State Standards, and there will be one test per unit.

Quizzes may be given throughout a unit. There may or may not be a quiz for each unit.