



8696

AUTOMOTIVE SYSTEMS AND
SERVICE (10)

20S/20E/20M

An Automotive Technology Course

8696: AUTOMOTIVE SYSTEMS AND SERVICE (10) 20S/20E/20M

Course Description

A student wanting to develop skills in the automotive service and repair industry must have knowledge of the basic principles related to automotive systems and service. Students learn safety, tools, and equipment including oxy-acetylene (OAW) welding and cutting, automotive systems, and service procedures, and are introduced to diagnostic strategies.

Goal 1: Describe and apply appropriate **health and safety** practices.

GLO 1.1: Describe and apply appropriate **health and safety** practices.

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| SLO 10.1.1.1 | Demonstrate awareness of the principles of Workplace Hazardous Materials Information Systems (WHMIS). |
| SLO 10.1.1.2 | Identify the safety requirements as they apply to WHMIS. (A2.9) (Level 1) |
| SLO 10.1.1.3 | Describe the purpose of Material Safety Data Sheets (MSDS). |
| SLO 10.1.1.4 | Demonstrate the ability to follow safety information on supplier labels. |
| SLO 10.1.1.5 | Follow safe practices and procedures for facilities, processes, materials, tools, and equipment used in an automotive shop. |
| SLO 10.1.1.6 | Locate first aid and eyewash station. |
| SLO 10.1.1.7 | Recognize, report, and control hazards (e.g., electrical, ergonomic, material handling, chemicals, and spills). (A2.6) (Level 1) |
| SLO 10.1.1.8 | Identify and control hazards. (A2.10) (Level 1) |
| SLO 10.1.1.9 | Identify the process for reporting injuries. |
| SLO 10.1.1.10 | Identify ergonomically correct procedures to avoid injury (e.g., stress, strain). (A2.5) (Level 1) |
| SLO 10.1.1.11 | Describe hybrid vehicle safety hazards. (G1.2) (Level 1) |
| SLO 10.1.1.12 | Describe the importance of using personal protective equipment (PPE), and identify PPE and procedures related to PPE. (A2.2) (TSA 16) |
| SLO 10.1.1.13 | Outline the safety principles for working on and around electrical or energized equipment. (A2.3) (TSA 18) |

SLO 10.1.1.14	Identify fire safety and outline workplace fire safety principles. (A2.4) (TSA 19)
SLO 10.1.1.15	Identify the hazards in confined spaces and the preparation needed to work in them. (A2.7) (TSA 20)
SLO 10.1.1.16	Identify safety and health requirements. (A2.1) (Level 1)
SLO 10.1.1.17	Identify first aid/CPR. (A2.8) (Level 1)
SLO 10.1.1.18	Identify hazards and describe safe work practices pertaining to the use of tools and equipment. (A3.1) (Level 1)
SLO 10.1.1.19	Identify hazards and describe safe work practices pertaining to hoisting and lifting. (A4.2) (Level 1)
SLO 10.1.1.20	Create and maintain a safe and organized working environment.
SLO 10.1.1.21	Identify hazards and describe safe work practices pertaining to oxy-acetylene welding and cutting. (A8.2) (Level 1)
SLO 10.1.1.22	Identify hazards and describe safe work practices pertaining to accessory drive systems. (B1.2) (Level 1)
SLO 10.1.1.23	Identify hazards and describe safe work practices pertaining to tires and wheels. (E1.2) (Level 1)
SLO 10.1.1.24	Identify hazards and describe safe work practices pertaining to vehicle maintenance inspections. (A10.2) (Level 1)

GLO 1.2: Demonstrate awareness of safety as it pertains to the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Select, use, and manage **tools, equipment, materials, and consumables**.

GLO 2.1: Select, use, and manage **tools and equipment**.

SLO 10.2.1.1	Select, use, and manage tools and equipment used in automotive systems and service.
SLO 10.2.1.2	Identify types of hand tools, and describe their applications and procedures for use. (A3.2) (Level 1)
SLO 10.2.1.3	Identify types of hoisting and lifting equipment and accessories, and describe their applications. (A4.4) (Level 1)
SLO 10.2.1.4	Describe and demonstrate the procedures used when hoisting and lifting. (A4.5) (Level 1)

SLO 10.2.1.5	Describe the procedures used to inspect, maintain, and store hoisting and lifting equipment. (A4.6) (Level 1)
SLO 10.2.1.6	Identify types of tools and equipment relating to accessory drive systems, and describe their applications and procedures for use. (B1.3) (Level 1)
SLO 10.2.1.7	Identify types of lubricants and fluids requiring service checks. (A10.5) (Level 1)
SLO 10.2.1.8	Describe the procedure used to inspect, maintain, and store hand tools. (A3.3) (Level 1)
SLO 10.2.1.9	Identify types of power tools, and describe their applications and procedures for use. (A3.4) (Level 1)
SLO 10.2.1.10	Describe the procedures used to inspect, maintain, and store power tools. (A3.5) (Level 1)
SLO 10.2.1.11	Identify types of measuring tools, and describe/ demonstrate their applications and procedures for use. (A3.6) (Level 1)
SLO 10.2.1.12	Describe the procedures used to inspect, maintain, and store measuring tools. (A3.8) (Level 1)
SLO 10.2.1.13	Identify types of shop equipment, and describe their applications and procedures for use. (A3.9) (Level 1)
SLO 10.2.1.14	Describe the procedures used to inspect, maintain, and store shop equipment. (A3.10) (Level 1)
SLO 10.2.1.15	Identify types of welding, cutting, and heating equipment, and describe their applications. (A3.11) (Level 1)
SLO 10.2.1.16	Define terminology associated with hoisting and lifting. (A4.1) (Level 1)
SLO 10.2.1.17	Interpret information pertaining to hoisting and lifting found on drawings and specifications. (A4.3) (Level 1)

GLO 2.2: Select, use, and manage **materials and consumables.**

SLO 10.2.2.1	Identify types of fittings, and describe their applications and procedures for use. (A3.14) (Level 1)
SLO 10.2.2.2	Identify types of fluids, and describe their applications and procedures for use. (E2.7) (Level 1)
SLO 10.2.2.3	Identify types of fasteners, and describe their applications and procedures for use. (A3.12) (Level 1)

GLO 2.3: Demonstrate welding and cutting.

- SLO 10.2.3.1 Define terminology associated with oxy-acetylene welding and cutting. (A8.1) (Level 1)
- SLO 10.2.3.2 Identify oxy-acetylene welding and cutting equipment and accessories, and describe their applications. (A8.3) (Level 1)
- SLO 10.2.3.3 Identify types of oxy-acetylene processes, and describe their characteristics and applications. (A8.4) (Level 1)
- SLO 10.2.3.4 Describe and demonstrate the procedures used to set up, adjust, and shut down oxy-acetylene welding and cutting equipment. (A8.5) (Level 1)
- SLO 10.2.3.5 Describe the procedures used to inspect, maintain and store oxy-acetylene welding and cutting equipment. (A8.6) (Level 1)
- SLO 10.2.3.6 Describe and demonstrate the procedures used to operate oxy-acetylene equipment. (A8.7) (Level 1)
- SLO 10.2.3.7 Identify types of weld defects and describe their causes. (A8.8) (Level 1)
- SLO 10.2.3.8 Describe the procedures used to prevent and correct weld defects. (A8.9) (Level 1)

Goal 3: Describe, inspect, diagnose, service, and repair automotive components and systems.

GLO 3.1: Describe automotive components and systems.

- SLO 10.3.1.1 Identify vehicles equipped with current tire technology and procedures required to complete service.
- SLO 10.3.1.2 Identify tire pressure monitoring systems and their service procedures.
- SLO 10.3.1.3 Describe the functions of external engine parts and related components.
- SLO 10.3.1.4 Describe brake system components.
- SLO 10.3.1.5 Define terminology associated with accessory drive systems. (B1.1) (Level 1)
- SLO 10.3.1.6 Define terminology associated with tires, wheels, and hubs. (E1.1) (Level 1)
- SLO 10.3.1.7 Describe the importance of tire rotation and maintenance. (E1.6) (Level 1)
- SLO 10.3.1.8 Define terminology associated with vehicle maintenance inspections. (A10.1) (Level 1)
- SLO 10.3.1.9 Describe the importance of regular vehicle maintenance inspections. (A10.7) (Level 1)

GLO 3.2: Inspect and diagnose automotive components and systems.

SLO 10.3.2.1 Describe the procedures used to diagnose accessory drive systems. (B1.5) (Level 1)

GLO 3.3: Service and repair automotive components and systems.

SLO 10.3.3.1 Check vehicle fluid levels.

SLO 10.3.3.2 Demonstrate the appropriate use of fasteners used in automotive applications.

SLO 10.3.3.3 Demonstrate an awareness of the application of torque and the units used to measure torque in automotive fasteners.

SLO 10.3.3.4 Describe and demonstrate the procedures used to adjust, repair, and/or replace accessory drive system components. (B1.6) (Level 1)

SLO 10.3.3.5 Participate in the service and repair of components and systems (i.e., scheduled maintenance and inspection).

SLO 10.3.3.6 Describe and demonstrate the procedures used to perform vehicle maintenance inspections. (A10.6) (Level 1)

SLO 10.3.3.7 Perform basic scan-tool fundamentals (i.e., DTC retrieval).

SLO 10.3.3.8 Demonstrate the use of fastener repair methods.

SLO 10.3.3.9 Perform engine oil and filter change.

SLO 10.3.3.10 Remove, balance, rotate, and reinstall wheel and tire assemblies.

Goal 4: Describe and apply the transferable **cross-curricular** knowledge and skills.

GLO 4.1: Demonstrate the application of **information and communication technologies**.

SLO 10.4.1.1 Demonstrate the use of service information retrieval systems unique to the automotive service and repair industry (e.g., Mitchell On Demand, All Data, IATN).

GLO 4.2: Read, interpret, and communicate information.

SLO 10.4.2.1 Identify sources of related information. (A6.1)

GLO 4.3: Demonstrate **mathematical skills**.

- SLO 10.4.3.1 Review general math concepts and use of electronic calculators. (A7.3) (Level 1)
 - SLO 10.4.3.2 Identify units of measure on a ruler.
 - SLO 10.4.3.3 Measure various articles in length and width using a ruler.
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GLO 4.4: Demonstrate skills in the **sciences**.

- SLO 10.4.4.1 Describe an awareness of how science principles (e.g., ideal gas laws, viscosity, coefficient of friction, atomic model of matter, etc.) as they apply to automotive systems and service.
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Goal 5: Demonstrate an understanding of **sustainability**.

GLO 5.1: Demonstrate an understanding of **sustainability**.

- SLO 10.5.1.1 Describe and apply efficient materials usage and disposal practices.
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Goal 6: Follow **ethical and legal standards**.

GLO 6.1: Follow **ethical and legal standards**.

- SLO 10.6.1.1 Demonstrate an awareness of liability concerns related to automotive systems and service.
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Goal 7: Demonstrate **employability skills**.

GLO 7.1: Demonstrate **employability skills**.

- SLO 10.7.1.1 Demonstrate problem-solving skills.
 - SLO 10.7.1.2 Demonstrate critical-thinking skills.
 - SLO 10.7.1.3 Demonstrate regular attendance and punctuality.
 - SLO 10.7.1.4 Demonstrate accountability by taking responsibility for their actions.
 - SLO 10.7.1.5 Demonstrate adaptability, initiative, and effort.
 - SLO 10.7.1.6 Accept and follow direction and feedback.
 - SLO 10.7.1.7 Demonstrate teamwork skills.
 - SLO 10.7.1.8 Stay on task and use time effectively.
 - SLO 10.7.1.9 Communicate respectfully and effectively.
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GLO 7.2: Demonstrate an understanding of the **business operation** of a repair/service facility.

No applicable SLOs.

Goal 8: Understand **educational and career opportunities.**

GLO 8.1: Understand **educational and career opportunities.**

SLO 10.8.1.1 Describe career and employment opportunities related to automotive technology.

SLO 10.8.1.2 Describe the structure and scope of the trade. (A1.1) (Level 1)

Goal 9: Explore **evolution, technological progression, and emerging trends.**

GLO 9.1: Explore **evolution, technological progression, and emerging trends.**

SLO 10.9.1.1 Identify changes to vehicle design and their effect on safety, fuel economy, emissions, and vehicle performance.
