



8699

DRIVETRAIN FUNDAMENTALS
AND SERVICE (11C)

30S/30E/30M

An Automotive Technology Course

8699: DRIVETRAIN FUNDAMENTALS AND SERVICE (11C) 30S/30E/30M

Course Description

A student wanting to develop skills in the automotive industry must have knowledge of the basic principles of the vehicle drivetrain. The student will develop an understanding of the different drivetrain configurations and their components. The student will be able to diagnose and repair a variety of drivetrain components.

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

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

- SLO 11C.1.1.1 Demonstrate awareness of the principles of Workplace Hazardous Materials Information Systems (WHMIS).
- SLO 11C.1.1.2 Identify the safety requirements as they apply to WHMIS. (A2.9) (Level 1)
- SLO 11C.1.1.3 Describe the purpose of Material Safety Data Sheets (MSDS).
- SLO 11C.1.1.4 Demonstrate the ability to follow safety information on supplier labels.
- SLO 11C.1.1.5 Follow safe practices and procedures for facilities, processes, materials, tools, and equipment used in an automotive shop.
- SLO 11C.1.1.6 Locate first aid and eyewash station.
- SLO 11C.1.1.7 Recognize, report, and control hazards (e.g., electrical, ergonomic, material handling, chemicals, and spills). (A2.6) (Level 1)
- SLO 11C.1.1.8 Identify and control hazards. (A2.10) (Level 1)
- SLO 11C.1.1.9 Identify the process for reporting injuries.
- SLO 11C.1.1.10 Identify ergonomically correct procedures to avoid injury (e.g., stress, strain). (A2.5) (Level 1)
- SLO 11C.1.1.11 Describe hybrid vehicle safety hazards. (G1.2) (Level 1)
- SLO 11C.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 11C.1.1.13 Outline the safety principles for working on and around electrical or energized equipment. (A2.3) (TSA 18)

SLO 11C.1.1.14	Identify fire safety and outline workplace fire safety principles. (A2.4) (TSA 19)
SLO 11C.1.1.15	Identify the hazards in confined spaces and the preparation needed to work in them. (A2.7) (TSA 20)
SLO 11C.1.1.16	Identify safety and health requirements. (A2.1) (Level 1)
SLO 11C.1.1.17	Identify first aid/CPR. (A2.8) (Level 1)
SLO 11C.1.1.18	Identify hazards and describe safe work practices pertaining to the use of tools and equipment. (A3.1) (Level 1)
SLO 11C.1.1.19	Identify hazards and describe safe work practices pertaining to hoisting and lifting. (A4.2) (Level 1)
SLO 11C.1.1.20	Create and maintain a safe and organized working environment.

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 11C.2.1.1	Select, use, and manage tools and equipment used in drivetrain fundamentals and service.
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GLO 2.2: Select, use, and manage **materials and consumables**.

No applicable SLOs.

GLO 2.3: Demonstrate **welding and cutting**.

No applicable SLOs.

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

GLO 3.1: Describe automotive components and systems.

SLO 11C.3.1.1	Describe the location and function of clutch-assembly components.
SLO 11C.3.1.2	Describe clutch action, and identify common clutch problems.
SLO 11C.3.1.3	Describe shift linkages and their adjustments.
SLO 11C.3.1.4	Describe types of driveshafts and drive axles.

- SLO 11C.3.1.5 Describe types of transmissions and transaxles.
 - SLO 11C.3.1.6 Describe the operating principles and function of manual transmissions and transaxles.
 - SLO 11C.3.1.7 Describe types of gears, power flows, and calculate gear ratios on drivetrains.
 - SLO 11C.3.1.8 Describe the basic operating principles and functions of automatic transmissions and transaxles.
 - SLO 11C.3.1.9 Describe the operation principles of drivetrain components (e.g., 4WD, AWD, CVTs).
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GLO 3.2: Inspect and diagnose automotive components and systems.

- SLO 11C.3.2.1 Perform visual fluid analyses on drivetrain components.
 - SLO 11C.3.2.2 Diagnose causes of fluid leaks and recommend repair options.
 - SLO 11C.3.2.3 Demonstrate familiarity with proper clutch operation.
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GLO 3.3: Service and repair automotive components and systems.

- SLO 11C.3.3.1 Demonstrate familiarity with the diagnosis, adjustment, and replacement of clutch assemblies and related components.
 - SLO 11C.3.3.2 Demonstrate familiarity of the inspection, service, and adjustment of shift mechanisms.
 - SLO 11C.3.3.3 Demonstrate familiarity with the diagnosis, adjustment, and replacement of transmissions and transaxles.
 - SLO 11C.3.3.4 Demonstrate familiarity with the diagnosis, adjustment, and replacement of differential assemblies.
 - SLO 11C.3.3.5 Demonstrate familiarity with differential maintenance procedures.
 - SLO 11C.3.3.6 Demonstrate the service procedures for driveshaft components.
 - SLO 11C.3.3.7 Demonstrate the service procedures for drive axle components.
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Goal 4: Describe and apply the transferable **cross-curricular** knowledge and skills.

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

- SLO 11C.4.1.1 Demonstrate use of computer-based/print-based service manuals to locate, interpret, and apply service procedures.
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GLO 4.2: Read, interpret, and communicate information.

- SLO 11C.4.2.1 Read, interpret, and communicate automotive product information.
 - SLO 11C.4.2.2 Describe the importance of communicating job requirements. (A5.3) (Level 1)
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GLO 4.3: Demonstrate mathematical skills.

No applicable SLOs.

GLO 4.4: Demonstrate skills in the sciences.

- SLO 11C.4.4.1 Demonstrate knowledge of science as it relates to drivetrains.
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Goal 5: Demonstrate an understanding of sustainability.

GLO 5.1: Demonstrate an understanding of sustainability.

- SLO 11C.5.1.1 Demonstrate knowledge of efficient material usage to reduce waste and its impact on the environment.
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Goal 6: Follow ethical and legal standards.

GLO 6.1: Follow ethical and legal standards.

No applicable SLOs.

Goal 7: Demonstrate employability skills.

GLO 7.1: Demonstrate employability skills.

- SLO 11C.7.1.1 Demonstrate problem-solving skills.
 - SLO 11C.7.1.2 Demonstrate critical-thinking skills.
 - SLO 11C.7.1.3 Demonstrate regular attendance and punctuality.
 - SLO 11C.7.1.4 Demonstrate accountability by taking responsibility for their actions.
 - SLO 11C.7.1.5 Demonstrate adaptability, initiative, and effort.
 - SLO 11C.7.1.6 Accept and follow direction and feedback.
 - SLO 11C.7.1.7 Demonstrate teamwork skills.
 - SLO 11C.7.1.8 Stay on task and use time effectively.
 - SLO 11C.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 11C.8.1.1 Describe career and employment opportunities related to automotive technology.

SLO 11C.8.1.2 Demonstrate an awareness of career paths related to the automotive service and repair industry.

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

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

SLO 11C.9.1.1 Demonstrate an understanding of the evolution, technological progression, and emerging trends in drivetrain fundamentals and service.
