

TRN 110 Introduction to Transportation Technology

COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course covers workplace safety, hazardous materials, environmental regulations, hand tools, service information, basic concepts, vehicle systems, and common transportation industry terminology. Topics include familiarization with major vehicle systems, proper use of various hand and power tools, material safety data sheets, and personal protective equipment. Upon completion, students should be able to demonstrate appropriate safety procedures, identify and use basic shop tools, and describe government regulations regarding transportation repair facilities. Course Hours Per Week: Class, 1. Lab, 2. Semester Hours Credit, 2.

STUDENT LEARNING OUTCOMES:

Upon successful completion of this course, the student will be able to:

(State-wide outcomes)

- a. Demonstrate work place safety and hazardous waste disposal per OSHA and EPA guidelines that apply to relevant transportation industry work.
- b. Given a vehicle or piece of equipment, students will be able to identify it and locate relevant service information in one or more industry-standard databases.
- c. Demonstrate proficiency hoisting transportation vehicles through use of lifts and floor jacks.
- d. Complete service repair orders with appropriate information: customer contact information; VIN; cause, concern, correction.
- e. Identify and communicate about basic systems and terms associated with the transportation industry.
- f. Distinguish between different transportation systems terms and components either on a written exercise or in a lab environment.
- g. Demonstrate proper use and care of related transportation industry tools and equipment.
- h. Correctly identify or describe government regulations associated with the transportation industry.

(Local outcomes)

- i. Select and correctly use tools for their intended or designed purpose.
- j. Demonstrate proper care and storage of tools.
- k. Perform basic automotive service operations associated with cleaning tools, tubing tools, threading tools, drills and reamers, screw extractors, and a variety of miscellaneous tools available to the automotive service industry.
- l. Identify, select, and properly use fasteners available to the automobile service industry.
- m. Select appropriate technical manuals, interpret and use technical specifications and

- procedural information accurately.
- n. Demonstrate proper use and care of precision measuring instruments.
 - o. Identify and properly use various chemicals available to the automotive service industry.
 - p. Demonstrate proper set-up and use of welding equipment.
 - q. Demonstrate appropriate use and handling of hazardous and potentially hazardous material in the shop.
 - r. Perform a North Carolina State inspection.
 - s. Identify the basic systems found on an automobile
 - t. Identify typical shop procedures used in the industry.
 - u. Identify pay and benefit plans used in the local industry.

OUTLINE OF INSTRUCTION:

- I. Class orientation
 - A. Introduction and welcome
 - B. Student packets
 - C. Class/lab routine
 - D. Shop Safety

- II. Hand tools
 - A. Location and identification
 - B. Types (frequently used) standard and metric
 - 1) Wrenches
 - 2) Sockets
 - 3) Ratchets
 - 4) Extensions
 - 5) Screwdrivers
 - 6) Chisels and punches
 - 7) Hammers
 - 8) Pullers and accessories

- III. Portable power tools
 - A. Impact wrenches-types
 - 1) Air wrenches
 - 2) Electric wrenches
 - B. Drills-types
 - 1) Air powered drills
 - 2) Electric drills
 - C. Power chisels and cutting tools

- IV. Stationary power tools
 - A. Bench grinder
 - B. Drill press

- C. Hydraulic press
- V. Threading and extracting tools
 - A. Taps and dies
 - B. Thread inserts
 - C. Screw/stud extractors
- VI. Precision Measuring Devices
 - A. Feeler gauges
 - B. Calipers
 - C. Straightedge
 - D. Micrometers
 - E. Dial indicators
 - F. Telescoping and small hole gauges
 - G. Torque wrenches
- VII. Flaring tools
 - A. Single lap flaring
 - B. Double lap flaring
 - C. ISO
- VIII. Threaded fasteners
 - A. Bolt strength ID - inch system
 - B. Bolt strength ID - metric system
 - C. Threads - English ID
 - 1) Unified National Course (UNC or NC)
 - 2) Unified National Fine (UNF or NF)
 - 3) Unified National Extrafine (UNEF or NEF)
 - 4) Unified National Pipe Threads (UNPT or NPT)
 - D. Threads - Metric ID
 - 1) System International d'Unites (SI) or International System of Units
 - 2) International standards organization (ISO)
 - E. Bolt size
 - F. Thread pitch
 - G. Tensile strength
- IX. Welding
 - A. Oxy-Acetylene Basics
 - 1) Cutting
 - 2) Brazing
 - 3) Welding
 - B. Arc Welding
 - 1) Set-up and electrode selection
 - 2) Joints, Lap and butt

- X. Chemicals
 - A. Penetrants
 - B. Lubricants
 - C. Sealants
 - 1) Aerobic (RTV)
 - 2) Anaerobic
 - 3) Thread
 - D. Cleaners

- XI. Service Information Resources
 - A. Computer based service information
 - B. Manuals
 - C. Technical Service Bulletins
 - D. Parts and Labor Guide

- XII. Environmental, Safety and Industry Regulations
 - A. Hazardous Waste Handling
 - 1) Material Safety Data Sheets
 - 2) Proper storage
 - 3) Proper disposal
 - 4) Hazardous waste spill procedures
 - B. Safety Regulations
 - 1) Occupational Safety and Health Administration
 - 2) American National Specifications Institute
 - 3) Environmental Protection Agency
 - 4) Local Enforcement
 - C. Industry Regulations
 - 1) National Highway Transportation Safety Administration
 - 2) Society of Automotive Engineers
 - 3) International Standards Organization
 - 4) American Petroleum Institute
 - 5) Environmental Protection Agency

- XIII. North Carolina Safety and Emissions Inspection
 - A. North Carolina statutes
 - B. Division of Motor Vehicles rules
 - C. Inspection Procedures
 - 1) Safety
 - 2) Emission
 - D. Penalties

- XIV. Automotive Systems
 - A. Engine

- 1) Gasoline
 - (a) Mechanical system
 - (b) Fuel system
 - (c) Ignition system
 - (d) Cooling system
 - (e) Electrical system
 - 2) Diesel
 - (a) Mechanical system
 - (b) Fuel system
 - (c) Cooling system
 - (d) Electrical system
 - 3) Alternative Fuels
- B. Drivetrain
- 1) Clutch
 - 2) Transmission/transaxles
 - 3) Driveline
 - 4) Differential
 - 5) Driving Axles
- C. Chassis
- 1) Suspension
 - 2) Steering
 - 3) Brakes
 - 4) Tires and wheels

XV. Automotive Shop Operations

- A. Dealership
- 1) Pay Plans
 - 2) Benefits
 - 3) Functional layout
 - 4) Procedures
 - 5) Training
- B. Independent Repair Facilities
- 1) Pay Plans
 - 2) Benefits
 - 3) Functional layout
 - 4) Procedures
 - 5) Training

REQUIRED TEXTBOOKS AND MATERIALS:

Required textbook to be determined by instructor.

Safety Glasses

Safety Footwear