

# DT COURSE STUDENT LEARNING OUTCOMES

## DT 100 - Introduction to Diesel Technologies

Students will be able to demonstrate mechanical aptitude in the performance of basic maintenance service items using correct tools, equipment and procedures.

Students will be able to employ appropriate workplace skills, including the application of personal and mechanical safety measures.

## DT 101 - Basic Diesel Engines

Students will be able to apply safety practices in a shop environment.

Students will be able to identify diesel engine components, and explain the theory of diesel engine operation.

Students will be able to use basic math skills for solving applied technical problems.

Students will be able to use units of measurement correctly and convert between metric and standard units of measure.

Students will be able to use a variety of precision measuring instruments correctly when inspecting mechanical components.

Students working in groups will be able to effectively communicate accumulated technical data and apply that information toward completion of course assignments, and participation in classroom discussions.

## DT 102 - Basic Heavy Duty Electrical Systems

Students will be able to identify the failure and repair of circuit or component failures using appropriate specialized tools and precision electrical test equipment.

Students will be able to locate and identify schematic wiring diagrams to formulate correct testing, diagnosis and repair procedure of electrical circuits or components.

Students will be able to employ appropriate workplace skills, including the application of personal and mechanical safety measures.

Students will be able to use simple algebra to solve applied technical problems.

Students working in groups will be able to communicate accumulated technical data effectively with each other to apply that information toward completion of course assignments.

## DT 103 - Light Duty Diesel Engines

Students will be able to apply safety practices in a shop environment.

Students will be able to identify light duty diesel engine components, and explain the theory of diesel engine operation on Cummins, Duramax and Powerstroke platforms.

## DT 104 - Diesel Equipment Service

Students will be able to apply safety practices in a shop environment.

Students will be able to demonstrate knowledge of Heavy Equipment Service and Maintenance.

Students will be able to demonstrate use of proper tools.

Students will be able to use a variety of precision measuring instruments to add, subtract, multiply, and divide standard and metric units of measure when inspecting mechanical and electronic components to solve applied technical problems.

Students will be able to work in teams to identify common problems and propose solutions that promote integrity and safety.

## DT 105 - Mobile Heating and Air Conditioning

Students will be able to identify the failure and repair procedures of component failures using appropriate specialized tools, precision test equipment, and resources.

Students will be able to locate and identify failures to safely formulate correct testing, diagnosis and repair procedure of heating/air conditioning systems and components including the application of personal and mechanical safety measures.

Students will be able to practice and be prepared for the EPA certification test.

## DT 106 - Heavy Duty Transmissions and Power Trains

Students will be able to demonstrate proper personal and shop safety procedures in a shop environment.

Students will be able to safely remove, disassemble, reassemble and install drivetrains and components using special tools.

Students will be able to identify and evaluate drivetrain components for possible reuse per manufacturer specifications and/or reference material.

Students will be able to look up manufacture procedures and specifications using books and electronic resources.

## DT 107 - Heavy Duty Automatic Transmissions and Drive Trains

Students will be able to demonstrate proper personal and shop safety procedures in a shop environment.

Students will be able to safely disassemble, inspect and reassemble drivetrain components using special tools.

Students will be able to use special and diagnostic tools to measure and evaluate components.

Students will be able to look up manufacture procedures and specifications using books and electronic resources.

## DT 110 - Heavy Duty Electrical Systems

Students will be able to diagnose problems and failures in electrical components and systems, including basic diesel charging, starting, and system problems.

Students will be able to explain the concepts of heavy duty/diesel battery, charging, starting, and electrical components/systems operation.

Students will be able to use basic math skills for solving applied technical problems.

Students will be able to identify different communication strategies and will appropriately apply them to evaluate conflict resolution in workplace and other situations.

Students will be able to use units of measurement correctly and convert between metric and standard units of measure.

## DT 115 - Diesel/Heavy Equipment Electrical Systems

Students will be able to diagnose problems and failures in electrical components and systems, including basic diesel charging, starting, and system problems.

Students will be able to explain the concepts of heavy duty/diesel battery, charging, starting, and electrical components/systems operation.

Students will be able to use basic math skills for solving applied technical problems.

Students will be able to identify different communication strategies and will appropriately apply them to evaluate conflict resolution in workplace and other situations.

Students will be able to use units of measurement correctly and convert between metric and standard units of measure.

## DT 117 - Advanced Diesel/Heavy Equipment Electronics

Students will be able to identify, test, and interpret failed computer controlled systems and components.

Students will be able to employ appropriate workplace skills, including the application of personal and mechanical safety measures.

Students will be able to formulate repair strategies for computer controlled systems or components. Students will use the appropriate specialized tools and equipment to repair computer controlled systems or components.

## DT 130 - Heavy Duty Hydraulics

Students will be able to demonstrate proper personal and shop safety procedures in a shop environment.

Students will be able to safely disassemble, inspect and reassemble Hydraulic components using special tools.

Students will be able to identify and operate different hydraulic systems.

Students will be able to analyze and interpret diagnostic and test information to formulate correct repair procedures.

Students will be able to use simple algebra and formulas for area, volume and distance of circles, spheres, and cylinders to solve applied technical problems.

Students will be able to identify ethical issues in a shop environment and work in groups to complete laboratory assignments requiring accurate communication.

## DT 145 - Diesel Brake Systems

Students will be able to describe and explain the operation of heavy equipment hydraulic and pneumatic brake systems.

Students will be able to perform foundation brake service using DOT approved procedures.

Students will be able to diagnose common heavy equipment brake system problems and failures.

Students will be able to calculate areas and volumes as applied to the solution of applied technical problems.

Students will be able to use ratios, proportions, angular measure and percents in the solution of applied technical problems.

Students will be able to analyze what constitutes negative attitudes, the impact these have on conflict, and apply conflict resolution methods to workplace situations.

## DT 150 - Principles of Diesel Hydraulic Systems

Students will be able to apply safety practices in a shop environment.

Students will be able to identify diesel hydraulic components, and explain the theory of diesel hydraulic system operation.

Students will be able to use basic math skills for solving applied technical problems.

Students will be able to use units of measurement correctly and convert between metric and standard units of measure.

Students will be able to use a variety of precision measuring instruments correctly when inspecting mechanical components.

Students working in groups will be able to effectively communicate accumulated technical data and apply that information toward completion of course assignments, and participation in classroom discussions.

## DT 198 - Special Topics in Diesel Technology

Students will be able to achieve individualized, specific learning outcomes developed collaboratively by the student and faculty member.

Students will be able to synthesize existing knowledge, abilities, and skills related to their educational program and occupational objectives.

## DT 201 - Diesel Brakes and Pneumatics

Students will be able to describe and explain the operation of medium/heavy duty hydraulic and pneumatic brake systems.

Students will be able to perform foundation brake service using DOT approved procedures.

Students will be able to diagnose common medium/heavy duty brake system problems and failures.

Students will be able to calculate areas and volumes as applied to the solution of applied technical problems.

Students will be able to use ratios, proportions, angular measure and percents in the solution of applied technical problems.

Students will be able to analyze what constitutes negative attitudes, the impact these have on conflict, and apply conflict resolution methods to workplace situations.

## DT 205 - Diesel/Heavy Equipment Drivetrain and Axles

Students will be able to demonstrate proper personal and shop safety procedures in a shop environment.

Students will be able to safely remove, disassemble, reassemble and install drivetrains and components using special tools.

Students will be able to identify and evaluate drivetrain components for possible reuse per manufacturer specifications and/or reference material.

Students will be able to look up manufacture procedures and specifications using books and electronic resources.

## DT 210 - Advanced Diesel Engines

Students will be able to disassemble & reassemble engines.

Students will be able to use special tools and diagnostic tools.

Students will be able to analyze engine components for possible reuse using the proper manufacturer specifications.

Students will be able to demonstrate proper personal and shop safety procedures in a shop environment.

Students will be able to look up manufacturer specifications using books and online resources.

## DT 211 - Light Duty Performance

Students will be able to describe the components of, and relationships between diesel fuel injection, intake and exhaust systems, including analysis of their efficiency and emissions standards.

Students will be able to analyze diesel fuel injection systems, including service and diagnosis of problems, of major manufacturers of light duty diesel engines.

Students will be able to use simple algebra and formulas for area, volume and distance of circles, spheres, and cylinders to solve applied technical problems.

Students will be able to identify ethical issues in a shop environment and work in groups to complete laboratory assignments requiring accurate communication.

## DT 217 - Electronic Diesel Fuel Injection

Students will be able to demonstrate the ability to diagnose problems in electronically controlled diesel fuel systems. This will include the use of computer interface, scanners and lab scopes.

Students will be able to demonstrate the ability to explain electronic diesel fuel injection systems, including service of problems in electronic controls.

Students will be able to demonstrate the ability to service the mechanical components of electronic diesel fuel injection systems. To include efficiency and application of current emissions standards.

## DT 235 - Steering and Suspension

Students will be able to identify the main components of steering and suspension systems.

Students will be able to demonstrate proper personal and shop safety procedures in a shop environment.

Students will be able to disassemble, inspect and assemble steering and suspension systems.

Students will be able to diagnose problems and failures in steering and suspension systems using precision measuring equipment.

## DT 250 - Preventive Maintenance

Students will be able to perform preventative maintenance procedures per FMCSA regulations that are cost effective for HD truck, HD truck fleet operations.

Students will be able to use a variety of precision measuring instruments to add, subtract, multiply, and divide standard and metric units of measure when inspecting mechanical and electronic components to solve applied technical problems.

Students will be able to work in teams to identify common problems and propose solutions that promote integrity and safety.

## DT 290 - Internship in Diesel Technology

Students will be able to achieve individualized, site-specific learning outcomes developed collaboratively by the employer, student, and faculty member.

Students will be able to practice effective workplace and employment skills in a professional environment.

Students will be able to synthesize "Theory of Operation" concepts with the new practical skills gained at the work site.