

ENGINE FUNDAMENTALS: INTERNAL COMBUSTION

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This course will give you a fundamental understanding of the parts and processes associated with automotive combustion engines. Internal combustion engines are used in cars, trucks, motorbikes, generators, and many other applications worldwide. This course will focus on the fundamental systems and components that may be found in internal combustion engines, including those for both diesel and gasoline, or petrol, type fuel systems. After taking this course, learners will be able to make more informed decisions for engine related industries.

Credit Hours **4**

Learning Objectives

- Recall some of the primary components of an internal combustion engine.
- Recognize elements of the fuel system, and how the elements relate to the engine.
- Understand some common components of the ignition system.
- Recall the elements in induction and exhaust systems.
- Distinguish between the various processes in the cranktrain and valvetrain systems.
- Recognize the automotive elements that provide cooling and lubrication.

Table of Contents

I. Engine Parts & Properties

- What is an Engine?
- Engine Labeling & Classification
- Basic Engine Components
- Engine Cycles
- Gasoline vs. Diesel
- Engine Management Systems

II. Fuel & Ignition Systems

- Fuel System
 - Fuel Pump and Fuel Injector
 - Throttle Body
 - Carburetor
- Ignition System

III. Induction & Exhaust Systems

- Induction System
 - Turbocharger
 - Supercharger
 - Intake Manifold
- Exhaust System
 - Exhaust Manifold & Catalytic Converter
 - EGR and AIR

IV. Cranktrain & Valvetrain Systems

- Cranktrain System
 - Piston, Crankshaft, Flywheel
- Valvetrain System
 - Camshaft, Valves, Cam Phasing

V. Cooling & Lubrication Systems

- Cooling System
 - Water Pump
 - Thermostat
 - Radiator
- Lubrication System
 - Oil Filter and Oil Pump

