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I	SECTION CODE	<b>HE</b>
II	SECTION NAME	<b>HEAT ENGINE</b>
III	COURSE CODE	<b>HE-01</b>
IV	COURSE TITLE	<b>BASIC AND MAINTAINENCE OF PETROL AND DIESEL ENGINE</b>
V	DURATION	01 Week
IV	<b>OBJECTIVES</b>	
On completion of the course, the learner will be able to identify the different parts of automobile systems and its maintenance techniques.		

## VI Course Content :

Theory topics	Practical Topics
ENGINE :- Definition ,Function, Types, Principle of Diesel & petrol cycle. Valve Timing . Mechanical Component:- Name, Location ,Function of each components. Intake and fuel system. :- Function, components & function of each components. Exhaust, lubrication and cooling system :- Definition and function of each components Electrical system :- starting and Ignition system, function , types & components , function of each Components.	Identification of different types of engine. Identification of different components of engine. Identification of different components of air Intake and fuel system and their maintenance. Identification of components of Exhaust, lubrication and cooling system and the maintenance. Identification of different components of starting and ignition system and their maintenance.


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I	SECTION CODE	HE
II	SECTION NAME	HEAT ENGINE
III	COURSE CODE	HE-02
IV	COURSE TITLE	BASIC OF PETROL , DIESEL ,CNG AND LPG ENGINE
V	DURATION	01 Week
IV	<b>OBJECTIVES</b>	
<p>On completion of the course, the learner will be able to identify the different parts of various engine components and its applications.</p>		

**VI Course Content :**

Theory topics	Practical Topics
<p>ENGINE: - Definition, Function, Principles and Difference between Diesel, petrol, CNG and LPG Engine. Valve Timing.</p> <p>Engine system: - such as mechanical components, Intake system, Fuel, Exhaust, system, and their Location, Function.</p> <p>Lubrication and cooling system: - Location, function.</p> <p>Comparison between petrol, diesel, LPG and CNG engine and their components.</p> <p>Electrical system: - starting and Ignition system, function , types &amp; components , function of each Components.</p>	<p>Identification of different types of engine and Systems of engine.</p> <p>Identification of different components of fuel system of petrol, diesel, CNG and LPG engine and their maintenance.</p> <p>Identification of different components of Intake, Exhaust, and lubrication system and their maintenance.</p> <p>Identification of different components of cooling and Ignition system and their maintenance.</p> <p>Identification of different components of starting system and their maintenance.</p>


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I	SECTION CODE	HE
II	SECTION NAME	HEAT ENGINE
III	COURSE CODE	HE-03
IV	COURSE TITLE	DIESEL FUEL SYSTEM AND ITS MAINTENANCE
V	DURATION	01 Week
IV	<b>OBJECTIVES</b>	
On completion of the course, the learner will be able to understand different fuel systems and able to demonstrate the practical competencies as stated in below contents.		

**VI Course Content :**

<b>Theory topics</b>	<b>Practical Topics</b>
<p>Diesel fuel and its properties, define diesel fuel injection system and its requirement. (function), types of fuel injection system, their definition and application.</p> <p>Mechanical fuel injection system definition and its types.</p> <p>Common rail system:- Def, types, layout, components its function and working common rail system.</p> <p>Individual pump system: - Def, function, layout, components its function, working and operation of individual pump system.</p> <p>Distributor pump system :- Def, function, layout, components its function, working and operation of distributor pump system</p> <p>Unit injector system :- def, layout, components its function, and working of unit injector system.</p>	<p>Identification of different types of fuel injection system and location of each components.</p> <p>Servicing of fuel tank, fuel feed pump.</p> <p>Servicing of fuel filter and different types of fuel injector.</p> <p>Testing fuel different types of injector for proper functioning.</p> <p>Setting fuel injection timing and starting and stopping engine.</p>

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I	SECTION CODE	<b>HE</b>
II	SECTION NAME	<b>HEAT ENGINE</b>
III	COURSE CODE	<b>HE-04</b>
IV	COURSE TITLE	<b>BASICS OF AUTOMOTIVE ELECTRICAL SYSTEM</b>
V	DURATION	01 Week
IV	<b>OBJECTIVES</b>	
On completion of the course, the learner will be able to understand the automotive electrical systems and able to demonstrate the practical competencies as stated in below contents.		

**VI Course Content :**

<b>Theory topics</b>	<b>Practical Topics</b>
<p>Fundamental facts about electricity and magnetisms.</p> <p>Electrical measuring instruments and their application.</p> <p>Automotive storage battery. :- function, construction, chemical reaction, testing, intelligent battery sensors.</p> <p>Ignition system:- function , types, construction , working.</p> <p>Starting system:- function , construction , working.</p> <p>Charging system :- function , construction , working.</p>	<p>Identification of different components of battery and use of</p> <p>Electrical measuring instruments.</p> <p>Checking and charging of battery.</p> <p>Checking different components of ignition system and setting ignition system.</p> <p>Checking and overhauling of different components of starting system.</p> <p>Checking and overhauling of different components of charging system.</p>

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I	SECTION CODE	HE
II	SECTION NAME	HEAT ENGINE
III	COURSE CODE	HE-05
IV	COURSE TITLE	VEHICLE POLLUTION AND ITS CONTROL
V	DURATION	02 Weeks
IV	<b>OBJECTIVES</b>	
On completion of the course, the learner will be able to understand the various methods to reduce the vehicle pollution and identify the different components of engine		

## VI Course Content :

Theory topics	Practical Topics
Pollution,- Meaning of Air pollution, effects of air pollution and its effects on environment and human health, Sources of vehicular pollution Vehicle emission (pollution) reduction techniques Appropriate maintenance of vehicle. New Technologies in reduction of Vehicle emission (pollution):-Improved air intake system, Improved combustion, Positive crank case ventilation, Petrol injection system. (SPFI & .MPFI), Catalytic converter, Vapors Recovery system, Automatic ignition / injection timing device, E G R , Electronic control of spark	Identification of different types of engine parts and their location from where the pollution takes place.  Identification of different types of engine parts and their location from where the pollution takes place.  Identification of different components of engine as per new technology which reduce the pollution and its maintenance.  Identification of different components of Exhaust , lubrication and cooling system and the maintenance.



& fuel, Air injection system, Alternative fuel, Electric vehicle, Hybrid vehicles.


Govt. regulation; - Checking PUC certificate .Checking driving license, vehicle fitness certificate, insurance.

Driving techniques/ habits:- Sudden acceleration/ de-acceleration, Sudden breaking , Avoiding frequent breaking, Ways of Warming engine.

Appropriate maintenance of Engine. :- Engine idle speed setting, Periodical tune up of engine.

Vehicle emission norm and its measurement.

Identification of different components of starting and ignition system and their maintenance.


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II	SECTION NAME	<b>HEAT ENGINE</b>
III	COURSE CODE	<b>HE-06</b>
IV	COURSE TITLE	<b>BASICS OF AUTOMOTIVE VEHICLE</b>
V	DURATION	01 Week
IV	<b>OBJECTIVES</b>	
<p>On completion of the course, the learner will be able to identify the different parts of automobile systems and its maintenance techniques applications.</p>		

**VI Course Content :**

<b>Theory topics</b>	<b>Practical Topics</b>
Automobile classification and its major components.	Identification of different components of automobile and its system.
Chassis classification and its major components i.e. Engine, transmission, Running system, control system and electrical.	Identification of different components of engine system.
Description classification, location and function of engine and its system .	Identification of different components of transmission system.
Transmission function, description and location.	Identification of different components of running and control system.
Running and control system. ( location, components and function )	Identification of different components of automobile electrical system.
Electrical system ( location, components and function)	

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I	SECTION CODE	<b>HE</b>
II	SECTION NAME	<b>HEAT ENGINE</b>
III	COURSE CODE	<b>HE-07</b>
IV	COURSE TITLE	<b>MAINTENANCE OF AUTO ELECTRICAL AND ELECTRONICS SYSTEM</b>
V	DURATION	02 Weeks
IV	<b>OBJECTIVES</b>	
On completion of the course, the learner will be able to diagnosis the problems in Automotive electrical system.		

**VI Course Content :**

<b>Theory topics</b>	<b>Practical Topics</b>
<p>Fundamental facts about electricity and magnetism. Introduction to electronics.</p> <p>Electrical measuring instruments and their application.</p> <p>Automotive storage battery. : - function, construction, chemical reaction, testing, intelligent battery sensors.</p> <p>Ignition system:- function , types, construction , working.</p> <p>Starting system: - function, construction, working.</p> <p>Charging system : function , construction , working.-</p>	<p>Identification of different components of battery and use of electrical measuring instruments.</p> <p>Checking and charging of battery.</p> <p>Checking different components of ignition system and setting ignition system.</p> <p>Checking and overhauling of different components of starting system.</p> <p>Checking and overhauling of different components of charging system.</p>

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I	SECTION CODE	<b>HE</b>
II	SECTION NAME	<b>HEAT ENGINE</b>
III	COURSE CODE	<b>HE-08</b>
IV	COURSE TITLE	<b>DIAGNOSIS OF PETROL AND DIESEL ENGINE</b>
V	DURATION	02 Weeks
IV	<b>OBJECTIVES</b>	
On completion of the course, the learner will be able to identify the different components of petrol and diesel engine and its applications.		

**VI Course Content :**

<b>Theory topics</b>	<b>Practical Topics</b>
<p><b>ENGINE:</b> - Definition, Function, Types, Principle of Diesel &amp; petrol cycle, Comparison between petrol and diesel cycle. Valve Timing and valve timing diagram, its types, advantages and disadvantages.</p> <p><b>Mechanical Component:</b> - Name, Location, Function Of each components and its repair and maintenance.</p> <p><b>Intake and fuel system. :-</b> Function, components &amp; function of each components, repair maintenance of petrol and diesel fuel system.</p> <p><b>Exhaust, lubrication and cooling system :-</b> Definition and function of each components and its repair , maintenance.</p> <p><b>Electrical system :-</b> starting and Ignition system, function , types &amp; components , function of each Components and its repair maintenance.</p>	<p>Identification of different types of engine</p> <p>Identification of different components of engine.</p> <p>Identification of different components of air Intake and fuel system and their Servicing.</p> <p>Identification of different components of Exhaust, lubrication and cooling system and their servicing.</p> <p>Identification of different components of Battery, starting and ignition system and their Servicing.</p>

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