## Four Wheeler Engine Mechanism Course – PCP (Theory & Practical) Training Schedule

| Total course duration ( 400 hr) | | |
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| PCP ( 200 hrs) | | Self learning ( 200 hrs) |
| Practical ( 120 hrs) | Theory ( 80 hrs) | |

| | Schedule | | PCP- Topic | | | | Instruction to instructor | Learning outcomes- After attending the PCP learner will be able to -: |
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| Week | Topic | Day | Duration (Hr) | Theory | Duration (Hr) | Practical | | |
| Week 1 | Introduction with automobile-<br><br>Workshop safety & precautions- | DAY 1 | 2 hrs | • Evolution of automobile to today vehicle.<br>• Classification of vehicles.<br>• General health & precautions | 3 hrs | • Show a film on journey of automobile<br><br>• Charts on safety & health in work shop. | Use available resources to explain, what has been covered in theory. | • identify the important stages and name associated with automobile evolution.<br>• adopts the appropriate safety measures while working in a workshop. |
| | Introduction to hand tools | DAY 2 | 2 hrs | List out hand tools, their use ,safety precaution while using these and usage | 3hrs | Show hand tools used in auto repair work shops, give a feel of handling | Hand tools be shown, precaution to be taken while using these & actual practice | • identify & handle various tools used in workshop.<br>• identify which tool is to be used for particular job.<br>• adopts appropriate precautions while handling tools |
| Week 2 | Measuring & marking | DAY 1 | 2 hrs | Explain measuring tools used for measuring various | 4 hrs | Practical handling of equipments, their measuring | | • identify different measuring & |

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| | | | | components/jobs | | units, use etc | | marking tools.<br>• read the measuring units.<br>• handle the use of these tools. |
| | Location of different assemblies of vehicle | DAY 2 | 2 hrs | • Introduction to different assemblies, principals of working, location on vehicle & functions | 3hrs | • On vehicle practice location of assemblies | • To display assy. Of vehicle and let class see these and discuss various functions | • identifies the different sub assemblies that make up an automobile.<br>• explain how vehicle moves.<br>• locate the position of various sub assemblies. |
| Week 3 | Working of internal combustion engine ,4 stroke petrol | DAY 1 | 2 hrs | • Explain working of otto cycle & different strokes | 4hrs | • Introduction to engine components, their working ,construction & ,metal used | • Conduct class with dismantled engine for showing components of Petrol engine | • identify different parts of engine.<br>• differentiate between i.c & e.c. engine.<br>• explain the fundamentals of engine. |

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| | **. Internal Combustion Engine, 4 stroke-- diesel cycle** | **DAY 2** | **2 hrs** | **Explain working of 4 stroke in diesel cycle & difference in petrol & diesel engine** | **4hrs** | **Introduction of engine components, their working ,construction & ,metal used for diesel engines** | **Conduct class with dismantled diesel engine for showing components of engine** | • **identify different parts of engine.**<br>• **differentiate between spark ignition & compression ignition. engine.**<br>• **explain the working of diesel engine.** |
| **Week 4** | **Working- details of clutch, types ,functions & ,components** | **DAY 1** | **2 hrs** | **Explain working of clutch ,principles types, & functioning** | **4 hrs** | **Introduction of clutch, components, their working ,construction ,metal used & maintenance** | **Conduct class with dismantled clutch for showing components** | • **explain the working principle of clutch.**<br>• **identify different types of clutch.**<br>• **identify various parts that make up the clutch system.** |
| | **Working- details of gear box, types ,functions & ,components** | **DAY 2** | **2 hrs** | **Explain working of gear box ,principles types, & functioning** | **4hrs** | **Introduction of gear box components, their working ,construction ,metal used & maintenance** | **Conduct class with dismantled gear box for showing components of different type of gear boxes.** | • **explain the working principle of gear box.**<br>• **identify different types of gear box.**<br>• **identify different components of manual gearbox.** |
| **Week 5** | **Working- details of propeller shaft & universal joint, types ,functions & ,components .** | **Day 1** | **2 hrs** | **Explain working of propeller shaft & universal joint,, principles types, & functioning** | **4 hrs** | **Introduction of propeller shaft & , universal joint, components, their working ,construction ,metal used & maintenance** | **Conduct class with dismantled propeller shaft & u j cross, for showing components of different type of gear boxes.** | • **explain the working principle and function of propeller shaft & universal joint.**<br>• **identify different parts of propeller shaft & universal joint.** |
| | **Working- details of Differential, functions &** | **Day 2** | **2 hrs** | **Explain working of differential ,principles** | **4hrs** | **Introduction of differential Components, their working** | **Conduct class with dismantled for differential Showing components** | • **explain the working of differential.**<br>• **identify various components of a** |

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| | **,components** | | | **types, & functioning** | | **,construction ,metal used & maintenance** | **of different type of gear boxes.** | **differential.** |
| **Week 6** | **Working-details of Petrol engine & of components** | **Day 1** | **2hrs** | **Explain working of Petrol engine & of components** | **4 hrs** | **Introduction of Petrol engine main components & their working** | **Use ppts and video for demonstration of functions** | • **explain the working of petrol engine & main components.** |
| | **Working-details of Diesel engine & of components** | **Day 2** | **2 hrs** | **Explain working of Diesel engine & of components** | **4 hrs** | **Introduction of Diesel engine main components & their working** | **Use ppts and video for demonstration of functions** | • **explain the working of diesel engine & main components.** |
| **Week 7** | **Identification of engine parts** | **Day1** | **2 hrs** | • **Head**<br>• **Block**<br>• **Carburetor**<br>• **Intake manifold**<br>• **Exhaust manifold**<br>• **Ignition coil**<br>• **Distributor**<br>• **Spark plug**<br>• **Alternator**<br>• **Flywheel**<br>• **Oil sump** | **4 hrs** | **Dismantling of engine-:**<br>• **Drain the oil from engine.**<br>**Open following parts- air cleaner, carburetor, distributor, spark plug, alternator, fly wheel, oil sump.**<br>**Conduct class with an complete engine assembly** | | • **identify engine parts.**<br>• **Carry out dismantling of engine assembly.** |
| | **Servicing and inspection** | **Day2** | **2hrs** | • **Servicing of an engine.**<br>• **inspection** | **4 hrs** | • **clean with K-oil and high pressure water to clear air passages.**<br>**Inspect the following important parts-:**<br>• **Head gasket**<br>• **Head flatness**<br>• **Scored pistons**<br>• **Valve assembly**<br>• **Connecting shaft straightness**<br>• **Crank journal of crank-shaft**<br>• **Cylinder block ridges**<br>**Rocker arm** | | • **carry out general servicing of the engine.**<br>• **diagnose the fault by inspecting various internal parts of engine.** |

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| **Week 8** | **Assembly of an engine** | **Day 1** | **2 hr** | • **General safety precaution and tool handling guidance** | **4 hrs** | **Assemble the following parts-: Crank shaft, cam-shaft timing setting, ring fitting on the piston, oil-pump, oil filter fitting, valve fitting, head gasket, valve clearance setting e.t.c** | **Adopt appropriate safety measures while assembling the parts of engine.** | • **carry out the assembling of the engine parts.** |
| **Week 9** | **Working-details of Petrol engine Ignition system & its components** | **Day 1** | **2 hrs** | **Explain working of Petrol engine Ignition system & its components** | **4 hrs** | **Introduction of Petrol engine Ignition system & its components** | **Conduct class with dismantled components of Ignition system** | • **explain the working of petrol engine ignition system & components.** |
| | **Working-details of Diesel engine Ignition system & its components** | **Day 2** | **2hrs** | **Explain working of Diesel engine Compression Ignition system & its components** | **4hrs** | **Introduction of Diesel engine Compression Ignition system & its components** | **Conduct class with dismantled components of Diesel engine Compression Ignition system** | • **explain the working of diesel engine compression ignition system & components.** |
| **Week 10** | **Working-details of Petrol engine Fuel system & its components** | **Day 1** | **3 hrs** | **Explain working of Petrol engine Fuel system & its components** | **4 hrs** | **Introduction of Petrol engine Fuel system & its components** | **Conduct class with dismantled components of Petrol Fuel system** | • **explain the working of petrol engine fuel system & components.** |
| | **Working-details of Diesel engine Fuel system & its components** | **Day 2** | **3 hrs** | **Explain working of Diesel engine Fuel system & its components** | **4hrs** | **Introduction of Diesel engine Fuel system & its components** | **Conduct class with dismantled components of Diesel engine Fuel system** | • **explain the working of diesel engine fuel system & components.** |
| **Week** | **Working-** | **Day** | **2 hrs** | **Explain working of** | **4 hrs** | **Introduction of** | **Conduct class with** | • **explain the working of** |

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| **11** | **details of Petrol engine Fuel system MPFI** | **1** | | **Petrol engine Fuel system MPFI** | | **Petrol engine Fuel system MPFI** | **dismantled components of Petrol Fuel system & MPFI** | **petrol engine fuel system & mpfi.** |
| | **Working-details of Petrol engine Fuel system-Fuel pump & Other components** | **Day 2** | **2 hrs** | **Explain working of Petrol engine Fuel system - Fuel pump& Other components** | **4hrs** | **Introduction of Petrol engine Fuel pump Fuel system -& Other components** | **Conduct class with dismantled components of Petrol Fuel system-Fuel pump& Other components** | **explain the working of petrol engine fuel system - fuel pump& other components** |
| **Week 12** | **Working-details of Petrol engine & emission control system** | **Day 1** | **2 hrs** | **Explain working of Petrol engine & emission control system** | **4 hrs** | **Introduction of Petrol engine & emission control system** | **Conduct class with dismantled components of Petrol engine & emission control system** | **explain the working of petrol engine & emission control system** |
| | **Working-details of Petrol engine cooling system** | **Day 2** | **2 hrs** | **Explain working of Petrol engine cooling system** | **4hrs** | **Introduction of Petrol engine cooling system & Thermostat, water pump belt/water pump ,Radiator & fan** | **Conduct class with dismantled components of Petrol engine & Thermostat, water pump belt/water pump ,Radiator & fan** | **explain the working of petrol engine & thermostat, water pump belt/water pump ,radiator & fan** |
| **Week 13** | **Working-details of Petrol engine Lubrication system** | **Day 1** | **2 hrs** | **Explain working of Petrol engine Lubrication system** | **4 hrs** | **Introduction of Petrol engine Lubrication system** | **Conduct class with dismantled components of Petrol engine Lubrication system** | **explain the working of petrol engine lubrication system.** |
| | **Pollution control** | **Day2** | **2 hrs** | • **Source of pollution.**<br>• **Polluting chemicals**<br>• **Pollution control system** | **3 hrs** | **Demonstration of source of pollution.** | **Conduct class with dismantled components of pollution control systems** | • **identify the pollution source.**<br>• **identify the pollution control system.**<br>• **diagnose fault and** |

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| | | | | • Emission norms in India<br>• Ill effect of automobile pollution | | | | repair the fault of pollution control system. |
| Week 14 | Alternative fuels | Day 1 | 2 hrs | • LPG & CNG<br>• Methanol & ethanol<br>• Biodiesel<br>• Hydrogen<br>• Fuel cells | 3 hrs | Demonstration of sample of alternative fuels. Demonstrate vehicle running on LPG & CNG | Conduct class with dismantled components of LPG /CNG operated vehicles. | • identify various alternative fuels used in automobile. |
| | Electric cars & hybrid cars | Day2 | 2 hrs | • Introduction to electric cars and hybrid cars | 3 hrs | Demonstration of electric cars and hybrid cars | Conduct class with dismantled components of electric cars, use ppts or videos for demonstration | • identify the parts and function of an electric car and a hybrid car. |
| Week 15 | Basic computer knowledge | Day 1 | 2 hrs | Basic computer knowledge | 3hrs | Handling of computer on basic operations | Show basic computer usage an practice. | • switch on computer and open document to attend information |
| | Work shop Documentation | Day 1 | 2 hrs | Job card, spare part demand, collection of spare part from store, | 3 hrs | Handling of documents and understanding their purpose. | Practice on set documentation procedure. | • carry out documentation related to workshop. |
| Week 16 | Work shop layout | Day 1 | 2 hrs | • requirements of a work shop.<br>• Space, interior, lighting.<br>• Storage.<br>• Fire precautions | 3 hrs | Visit to an automobile work shop and record the observation of layout. | Arrange for visit in advance and ask for recording the observation. | • identify the location suitable for work shop.<br>• identify the requirements of the work shop.<br>• plan the interior of the automobile workshop. |
| | Work shop safety | Day 2 | 2 hrs | • Causes of accidents.<br>• Coping with an accident.<br>• CPR<br>• Bleeding control. | 3 hrs | • Demonstration and practice of CPR technique.<br>• Demonstrati | Mock drill for CPR technique.<br>Mock test for First – aid box component. | • identify and prevent the causes of accident at work shop.<br>• provide first-aid treatment in case of injury in workshop. |

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| | | | | • Maintain fractures.<br>• Soothing burns<br>• Treating eye injuries<br>• Electric shock | | on of first aid box .<br>• Practice for providing first-aid in case of injury. | | • provide cpr if required. |
| **Week 17** | **Self assessment on safety measures** | **Day 1** | **3 hrs** | • Explaining questions by way of discussions<br>• Objective questions on<br>• Workshop safety & precautions while handling equipment | **2hr** | **Class to demonstrate safety drill** | **-------** | **-------** |
| | **Self assessment on engine (petrol & diesel).** | **Day 2** | **3 hrs** | • Explaining questions by way of discussions<br>• Objective questions on Engine while handling job | | **-------** | **-------** | **-------** |
| **Week 18** | **Self assessment on lubrication system & cooling system** | **Day 1** | **3 hrs** | • Explaining questions by way of discussions on lubrication system.<br>• Objective questions on lubrication system, while handling job | | **-------** | **-------** | **-------** |
| | **Self assessment on Road safety.** | **Day 2** | **3hrs** | • Road rules other soft skills of driving Documentation of vehicle, driver.<br>• Objective questions on steering & brake system while handling job.<br>Show documents to class and discuss its clauses | | **-------** | **-------** | **-------** |