**AUTO MACHINE SHOP-I**

**6TH SEM**

**A.RATIONALE:**
Automobile engineers should know the use of measuring tools for automobile parts,
they should also know about intricate machining and finishing of automobile parts.
**B.OBJECTIVES:**
Student should be able to operate different machine tools required in an automobile
machine shop and use relevant measuring instruments.

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| SL.NO  | LIST OF EXPERIMENTS (4TH SEMESTER) |
|  | Checking flatness and squareness using a try square and filling the same if not leveled. |
|  | Sharpening of cutting tools like chisels, twist drill bit and punch through double ended grinder. |
|  | Internal threading of holes/ blind holes using hand taps. |
|  | Measurements of hole and slots using telescopic gauges and inside micrometer. |
|  | Measurement of size / depth and roundness of a object with a Vernier caliper. |
|  | Measurements of crank pins, main journal of crank shaft by using various measuring instruments. |
|  | Measurement of cylinder bore by inside micrometer. |
|  | Determinations of ovality and taper by using dial gauge. |
|  | Measurements of fillet radius of automotive components. |
|  | Operating of various workshop equipments such as: Valve re-facing M/C, Cylinder Honing M/C, Twin head M/C, horizontal Boring bar, Surface grinding M/C, Crank shaft Grinding M/C. |

**AUTO MACHINE SHOP-II**

**5TH SEM**

**RATIONALE:**
Automobile engineers should know the use of measuring tools for automobile parts, they should also know about intricate machining and finishing of automobile parts.
**OBJECTIVES:**
Student should be able to operate different machine tools required in an automobile machine shop and use relevant measuring instruments.

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| SL.NO  | LIST OF EXPERIMENTS (5TH SEMESTER) |
|  | i)Valve re-facing by valve re-facing machineii) Valve sheet cutting by manual & electric cuttersiii) Valve lapping & testing of leakage |
|  | Cylinder boring by using vertical boring bar. |
|  | Cylinder resleeving by hydraulic press. |
|  | Crank shaft grinding by using crank shaft grinding machine. |
|  | Fine finishing operation of cylinder bore by using cylinder honing machine. |
|  | Boring of main journals by using horizontal boring bar. |
|  | Connecting rod big end and small end boring using twin head machine. |
|  | Study of crank shaft grinding , piston grinding, surface grinding, cylinder re-boring honing & brake drum turning(by visiting different organization) |
|  | i)Brake shoe riveting.ii) Turning of propeller shaftiii) Different types of metal bush turning, reaming & setting. |
|  | Removing & refitting cylinder liners on cylinder bore. |
|  | Removing of broken stud & bolt by stud extractor & tap wrench. |

**AUTO ENGINE LAB-I**

**4TH SEM**

**AIM:-** Automobile students should have practical knowledge skill about various parts and systems involved in automobiles . This will positively help them in practical field to work.

**OBJECTIVES:-**

After completion the course students will be able to
1. Calculate IHP, BHP and FC of single cylinder, multi cylinder petrol and diesel engines.
2. Understand various parts and systems present in automobiles.

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| **SL.NO**  | **LIST OF EXPERIMENTS (4TH SEMESTER)** |
|  | Study of constructional details and working principle of petrol engine. |
|  | Study of constructional details and working principle of diesel engine. |
|  | Determine the brake thermal efficiency of a single cylinder petrol engine. |
|  | Determine the brake thermal efficiency of a single cylinder diesel engine |
|  | Determine B.H.P, I.H.P, BSFC of a multi cylinder engine by Morse test. |
|  | Study of fuel feed system of petrol and diesel engine |
|  | Testing of fuel injection system and adjustment of pressure of a fuel injector. |
|  | Identification of various units of a vehicle |
|  | Study of different types of cooling system used in a vehicle |
|  | Study of lubrication system of a vehicle |
|  | Study of different types of engines, adjustment of tappet, clearance of valve,timing adjustment etc. |
|  | Calibrating and phasing of fuel pump through calibrating machine. |
|  | Testing the Valve spring by spring tester. |
|  | Study of hydraulic control system and pneumatic control system. |
|  | Assembling engine parts such as F.I. pump, injector, fuel filter & other accessories. |
|  | Adjustment of valve tappet clearance (four cylinder/six cylinder engine) |
|  | Study of Air Compressor |

**AUTO ENGINE LAB-II**

**5TH SEM**

**AIM:**
Automobile students should have practical knowledge skill about servicing and maintenance work of various automobiles pars. This will positively help them in practical field to work.
**OBJECTIVES:**
After completion the course students will be able to do servicing and maintenance of various systems and components of a four wheeler.

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| **SL NO**  | **LIST OF EXPERIMENTS (5TH SEMESTER)** |
|  | Safety precaution in automobile workshop and Identification of different types of tools and equipments required in an automobile workshop. |
|  | Identification of different machines, equipments such as air compressor, hydraulic hoist, car washer, mechanical jacks, hydraulic jack, grease gun, oil gun, mechanical press, hydraulic press etc.. |
|  | Washing, cleaning, polishing and spray painting of cars. |
|  | Study of working principle of petrol and diesel engine. |
|  | Study of fuel feed system of petrol and diesel engine. |
|  | Testing of fuel injection system and adjustment of pressure of a fuel injector. |
|  | Identification of various units of a vehicle. |
|  | Study of different types of cooling system used in a vehicle. |
|  | Study of lubrication system of a vehicle. |
|  | Study of different types of engines, adjustment of tappet, clearance of valve, timingadjustment etc. |
|  | Calibrating and phasing of fuel pump through calibrating machine. |
|  | Testing the Valve spring by spring tester |
|  | Overhauling the piston and connecting rod assembly by connecting rod alignment fixture. |
|  | Adjustment of valve tappet clearance (four cylinder/six-cylinder engine |
|  | Assembling engine part, piston connecting rod, cylinder head, rocker arm assembly & mini force engine |
|  | Assembling engine parts such as F.I. pump injectors fuel filter & other accessories |
|  | Overhauling engine block crankshaft & camshaft |
|  | Servicing of inlet, exhaust manifolds silencers & tenpin. |
|  | Overhauling of fuel feed pump (both diesel & petrol). |
|  | Bleeding the fuel system in diesel engine. |
|  | Starting & stopping of diesel engine (Hand operated). |

**DRIVING PRACTICE & VEHICLE MAINTENANCE**

**6TH SEM**

**A.RATIONALE:**
An automobile engineer should be capable of making different mechanism or part of an automobile. This allows them to satisfy their inventive / developmental skill as well as get an intimate knowledge about the function of the mechanism / part. An automobile engineer, throughout his working life will be involved with automobile in one way or another. It is therefore, absolutely essential for an automobile engineer to learn to drive an automobile, at least a light vehicle. This course also gives the students opportunity to learn driving a light vehicle.
**B.OBJECTIVE:**
On completing of the course students will be able to
1.Gain confidence of making a product independently.
2. Drive a four wheeler car with confidence.

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| **SL NO**  | **LIST OF EXPERIMENTS (6TH SEMESTER)** |
|  | **I. DRIVING THEORY**1.Know the vehicle: Simple introduction to automobile engines and their working. |
| 2.Vehicle control: Foot controls: Foot brake, accelerator, clutch-dipper (not in present models).Hand controls: Steering wheel, hand brake, horn, light, wipers, ignition switch, starter, dipper and indicators.Other controls: Rear-view mirror (right and left side),instrument cluster, gauges, dials wind-screen-their purpose. |
| 3. Pre-driving checks Before sitting on driver’s seat and After sitting driver’s seat.4. Beginning to drive: Precaution just before moving. While moving sitting point Moving. Steering control. Changing of gear. Stopping Breaking Accelerator (gradual, sudden) Traffic sense, road sense, judgment, parking and positing according to road users.5. Driving on the road Reserving, anticipation, judgment and road positioning according to other road users.6. Maneuvers-Merging and diverging maneuvers turning maneuvers to left, right, about 3-point turn, 5-point turn and u-turn, overtaking stationery vehicle, moving vehicle in left side and right side.7. Reversing Location reverse gear in sitting position, speed control, steering in reverse gear, weaving the ‘S’ bend and common errors.8. Parking: Parallel, angular, perpendicular parking facing, downhill, common errors.9. Driver’s responsibility: Driving behavior, consideration for other road uses, Competitiveness over courtesy and confidence, impatience and defensive while on the road driving. Distance between cars.10. Priority for certain Emergency vehicles. Fire engines and ambulance. Vehicles. |
|  | **II. TRAFFICEDUCATION-I**1. Driving regulations: Road use regulation made under section 118 of the motorvehicle act,1988.2. Hand signals3. Traffic signs: Schedule to the motor vehicles Act,19884. Hand signals of traffic constables / Traffic warden.5. Introduction to automatic light signals.6. Introduction to road makings.7. Speed regulations on high ways and city roads.8. Parking at objectionable places.9. Some important provisions of the motor vehicles Act, 1988 section 122, 123, 125 and128 of the motor vehicles Act, 1988.10. Test of competence to drive Sub-rule (3) of rule 15 of the central motor vehicles rules,1989. |
|  | **III. LIGHT VEHICLES DRIVINGPRACTICE**1. Identification of various parts of the vehicles.2. Pre-driving checks• Before sitting on driver’s seat&• After sitting on driver’s seat.3. Steering practice4. Biting point5. Moving and gear changing6. Stopping• Normal stopping• Emergency stopping7. Developing judgment and anticipation to drive on road.8. Reversing• In straight• In ‘s’ bends9. Turning and about parking10. Licensing |

**ELECTRIC VEHICLE LAB.**

**6TH SEM**

**RATIONALE:**

An automobile engineer should be capable of making different mechanism or part of an automobile. This allows them to satisfy their inventive / developmental skill as well as get an intimate knowledge about the function of the mechanism / part. An automobile engineer, throughout his working life will be involved with automobile in one way or another. It is therefore, absolutely essential for an automobile engineer to learn to recent advancements and new technologies as well as the mechanisms used in electric powered vehicles. This course also gives the students opportunity to learn how to do maintenance work of electric vehicles.

**OBJECTIVES**

After undergoing the Project Work, the student will be able to:

1. The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences.
2. Maintenance of electric vehicle.

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| **SL NO**  | **LIST OF EXPERIMENTS (6TH SEMESTER)** |
|  | Develop block diagram of Electric vehicle and identify parts |
|  | Case study- Compare minimum four vehicles for economic and environmental analysis |
|  | Develop schematic diagram of hybrid electric vehicle and identify the componentsfluorescent lamp. |
|  | Prepare report on Plug in Electric vehicle by visiting a charging station |
|  | inspect and install inverter of given lead acid battery |
|  | Prepare a report on batteries used from market survey |
|  | Collect specifications of converters and inverters used for Electric vehicles a single lamp control by two switches |
|  | Diagnose, repair and maintain battery used in electric vehicle |
|  | Prepare test procedure for equipment used in Electric vehicle. |
|  | List safety procedures and schedule for handling HEVs and EVs |