

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 2

Mechanical Engineering (I.C.Engine & Automobile)

Subject Name Instrumentations & Vehicle Testing

Sr.No	Course content
5.	Planning and Measurement; Instrumentation; Selection of measuring instrument; requirements of measurement such as precision, accuracy, errors, sensitivity, readability and reliability; Measurement of thermo-physical properties; Devices to measure temperature and pressure of the working fluid, coolant, air and fuel flow into the engine.
6.	Indicating and recording instruments; Vibrometer; Accelerometer; vibration and pressure pickups; vibration test methods; Counters; stroboscopes; charge amplifiers; cathode ray oscillographs; FFT analyzer.
7.	Warning and alarm instruments; Brake actuation warning system; traficators; flash system; oil pressure warning system; engine over heat warning system; air pressure warning system; speed warning system; door lock indicators; gear neutral indicator; horn design; permanent magnet horn; air & music horns; safety air bag and latest developments.
8.	Data acquisition and processing: General data acquisition system examples, storage; processing, recording and display devices.
9.	ISI codes for testing automotive engines; Laboratory dynamometer testing systems of power train and vehicle under simulated conditions; Instrumentation for testing vehicles; road test of automobile vehicles; wheel alignment; balancing; PUC test of vehicles; preparation of test reports, EURO standards, Bharat stages.

List of Experiments:

1. Study of Garage layouts, Workshop management and Automotive service equipments.
2. Cleaning and Testing of a Petrol Injector on MPFI test bench.
3. Calibration and Phasing of Diesel Fuel Injection Pump on Fuel Pump test bench.
4. Study working principle and perform operation of (a) Four post hoist (b) Electronic air inflator (c) Tyre changer (d) Car Washer.
5. Overhauling of Carburetor.
6. Overhauling of Gearbox
7. Balancing of a wheel using Wheel balancer and Alignment measurement
8. Inspection and service of an Air conditioning system of a car using AC recovery unit and UV leak detector.

Tutorial :

- i Maintenance schedule chart for service of a car.
 - ii Service procedure for any car with necessary steps.
- 9. Visit of well equipped Automobile workshop.**

Reference Books:

1. Engineering Experimentation – Ernest O. Doebelin
2. Experimental Methods for Engineers – Holman J.P., McGraw Hill Book Co.
3. Measurement Systems, Applications & Design – Ernest O Doebelin, McGraw Hill Book Co.
4. Modern Electric Equipments for Automobiles – Judge A. W., Chapman Hall, London
5. Applied Instrumentation in Process Industries – Andrews W. G.