GUJARAT TECHNOLOGICAL UNIVERSITY
AUTOMOBILE ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Two and Three Wheeler Technology (Department Elective – I)**
Subject Code: **170206**

Teaching Scheme				Evaluation Scheme			
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (E)**		**Mid Sem Exam (Theory) (M)**	**Practical (Internal)**
				Theory	**Practical**		
4	0	2	6	70	30	30	20

Sr. No.	Course Contents	Total Hrs
1.	**Introduction:** Development history of two & three wheeler vehicles. Classification & layouts of two wheelers (motorcycles, scooters, mopeds) and Three wheelers vehicles (by applications – goods/passengers, carriage capacity). Study of technical specification of Two & Three wheelers.	5
2.	**Power Plant :** Selection criteria and Design considerations for two wheeler & three wheeler power plants (Engine). Systems requirements for Engine lubrication, cooling & starting (Kick starter mechanism, Moped cranking mechanism & Button Start mechanism). Recent developments in engine (2 stroke/4 storke engines, Fuel used – Gasoline, CNG, Diesel AND high powered engine), Electric Vehicles.	8
3.	**Transmission Systems:** Clutch – special requirements, different types used in two & three wheelers. Need of primary reduction, selection of transmission - gear box, gear shift mechanism, Chain OR belt drive system for transmission of torque to drive wheels, automatic transmission (Continuously Variable Transmission - CVT, Epicyclic gear train), arrangement of final drive & differential for three wheeler.	7
4.	**Steering & Suspension :** Steering system arrangement for two & three wheelers, steering column construction, steering geometry, Suspension requirements, design considerations, trailing & leading link, swinging arm, springs & shock absorbers.	6

5.	**Brake, Wheels & Tyres:** Design consideration of brake, types of brakes – disc, drum and braking mechanism – mechanical, hydraulic & serv. Hand operated or Foot operated barkes. Wheel types – spokes construction, alloy wheels, pressed wheel disc or split wheel disc. Types of tyres for two & three wheelers.	8
6.	**Frame & Body :** Types of frame, construction, loads, design consideration, materials, Types of three wheeler bodies, layout, RTO regulations, aerodynamic, aesthetic & ergonomics considerations for body work, side car.	6
7.	**Performance Parameters:** Handling characteristics, seating arrangement for driver & pillion rider, ergonomics & comfort, road holding & vehicle stability, riding characteristics, safety arrangements, Racing bikes – special requirements.	8
8.	**Electrical Systems & Instruments:** Battery specifications, Charging system, Lighting (front & rear), Ignition key switch, Horn, Side Signaling, Instruments & Indicators.	7
9.	**Two & three wheeler Maintenance:** Preventive & brake down maintenance, factors affecting fuel economy & emission.	5

Term Work:

The term work shall be based on the topics mentioned above.

Text Books:

1. Newton Steed, “The Motor Vehicle”, McGraw Hill Book Co. Ltd., New Delhi
2. Siegfried Herrmann, “The Motor Vehicle”, Asia Publishing House, Bombay.
3. “Two stroke Motor Cycles”, Staff & Motor Cycles, London llefe Books.
4. G.B.S. Narang, “Automobile Engineering”, 5th Edition, Khanna Publishers,Delhi.
5. Service Manuals of Manufacturers of Indian Two & Three wheelers.