GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Diploma in Vocation (D.Voc), 5th Semester
Branch: Automobile Servicing
Subject Name: Motor Vehicle Technology - II
Subject Code: 1250101

With effective from academic year 2018-19

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory		Tutorial/ Practical		
L	P	OJT	C	University exams (ESE)	Progressive Assessment (PA)	External Practical /viva Exam (ESE)	Internal evaluation Practical /viva Exam (PA)	
3	-	-	3	50	-	-	-	50

L- Lectures; P- Practical; OJT- On Job Training; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Content:

Sr. No.	Content	Hrs.
1	**FRAME AND BODY**: Function and construction of frame. Cross-section of frames. Unitized construction (monocoque) types of bodies. Terms - Turning radius, lock-to-lock angle, centre point steering, positive steering, gradeability. Idea of Safety features in a modern car.	8
2	**SUSPENSION SYSTEM:** Function. Types - conventional and independent. Spring types - coil, leaf - elliptical, semielliptical; helper springs, transverse springs. Spring camber; spring material. Torsion bar, stabilizer bar. Shock absorbers- telescopic and gas. Maruti suspension system and shockers. Anti-roll bars. Nitrox suspension.	8
3	**STEERING SYSTEM AND FRONT AXLE:** Principle - Ackermann and Davis. Function, requirements. Steering gear box - types. Construction and working details of worm and sector, rack and pinion, worm and wheel, worm and recirculating ball type. Tractor steering. Power steering. Electronic Steering. Front axle - rigid front axle. Stub axle. Elliot and reverse elliot type. Lemoine and reverse lemoine type. Tractor front axle. Maruti steering system. Wheel alignment - castor angle, camber angle, K.P.I., Toe-in, toe out. General values of these.	8
4	**BRAKING SYSTEM:** Braking terms - braking efficiency, stopping distance, stopping time, weight transfer during braking, leading/trailing shoe of brake. Determination of braking torque. Effect of braking on steering. Types of braking systems- constructional details and working of mechanical brakes, hydraulic brakes, parking brake, vacuum, pneumatic, air-hydraulic brakes; tractor brakes. Drum and disc brakes. Master cylinder, tandem master cylinder, wheel cylinder. Brake lining and brake fluid. Brake defects, their causes and remedies. Anti-Lock Braking System (ABS) & Electronic Brake Distribution (EBD).	8
5	**AUTOMOBILE POLLUTION AND ITS CONTROL**: Effects and extent of pollution caused due to stationary and automobile engines. Harmful products and their causes in petrol & diesel engines. Measures to control exhaust emissions from two-stroke engines, four-stroke engines, and diesel engines. Turbocharger. Products which cause de-activation of catalysts in catalytic converters. Unleaded petrol. Emission measuring instruments for petrol and diesel engines. Limits specified in Motor Vehicles Act. Recent trends in Automobile Pollution Control-Exhaust Gas Recirculation. Air Injection, Reactor System. Positive Crankcase Ventilation. Evaporative Emission Control System.	10
	Total	**42**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
5	10	20	10	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom's Taxonomy)

Reference Books:

1. Auto Fundamentals by Martin W. Stockel, Martin T. Stockel, Chris Jhoanson, Goodheart- Willcox company, Inc.
2. Automobile Engineering Vol-I & II by Dr. K.M. Gupta, Umesh Publications.
3. Automobile Engineering, Vol-I by Dr. Kripal Singh, standard publishes-distributors.
4. Automobile engineering by GBS Narang, Khanna Publication.

Course Outcomes:

After learning the course the students should be able to:
1. Understand the various vehicle classification and its layouts.
2. Understand the different types of suspension system and steering system.
3. Understand the functions of different types of brakes.