



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 4th Semester

Branch: Automobile Servicing

Subject Name: Vehicle Performance & Testing

Subject Code: 1140103

**With effective
from academic
year 2018-19**

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

Course Content:

| Unit No. | Content | Hrs |
|---------------------|---|-----------|
| 1 | Vehicle Performance Parameters: Vehicle Performance parameters: Fuel economy, acceleration, deceleration, gradability, top speed, handling, comfort, life durability, EGR systems, Impact of vehicular systems on performance: Suspension system, Steering system, Brakes, Tyres, carriage unit. Catalytic converters function and construction, Lambda close loop control system for gasoline vehicles. | 10 |
| 2 | Drive train and Component testing: Vehicular transmission performance: comparison of automotive clutches, Epicyclic transmission, torque converter, final drive and differential, testing of vehicle components: clutch, gear box (for noise and shifting force), brake testing, wheels and tyre testing – tyre wear pattern identification and causes. | 08 |
| 3 | Vehicle testing: Vehicle Testing - Road test, free acceleration test, coast down test, passer by noise test, road load data acquisition for vehicle. Test tracks: Proving ground testing, high speed track, pavement track, corrugated track, mud track, steering pad, gradient track, deep wading through shallow water Laboratory testing:Testing on chassis dynamometer, transition testing (Euro III onwards), accelerated testing, virtual testing, evaporative emission testing, oil consumption testing, endurance test, high speed performance test. Collisions and Crash Testing:Crash testing: Human testing, dummies, crashworthiness, pole crash testing, rear crash testing, vehicle to vehicle impact, side impact testing, crash test sensors, sensor mounting, crash test data acquisition, braking distance test. | 08 |
| 4 | Comfort, Convenience and Safety: Seats: types of seats, driving controls accessibility, and driver seat anthropometry. Steering: steering column angle, collapsible steering, and power steering. Adaptive cruise control, navigation system, adaptive noise control, driver information system, Safety: Motor vehicle safety standards, active safety, passive safety, bio-mechanics Structural safety, energy absorption, ergonomic consideration in safety. | 08 |
| 5 | Noise Vibration and EMI: Noise and vibration: Mechanism of noise generation, engine noise and vibration, causes and remedies on road shocks, wind noise and measurement. Automobile testing instrumentation: Sensors types and selection, instrumentation for functional tests, model test and full scale testing. | 08 |
| Total Hours: | | 42 |

Suggested Specification table with Marks (Theory):

| Distribution of Theory Marks | | | | |
|------------------------------|---------|---------|---------|---------|
| R Level | U Level | A Level | N Level | E Level |
| 5 | 15 | 15 | 10 | 5 |

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