



**GUJARAT TECHNOLOGICAL UNIVERSITY**

**Syllabus for Bachelor of Vocation (B.Voc), 3<sup>rd</sup> Semester**

**Branch: Automobile Servicing**

**Subject Name: Automobile Electrical System**

**Subject Code: 1130101**

**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	<b>STARTING SYSTEM:</b> Principle, construction and working of starter motor. Series motor and its characteristics, Compound wound motor, Engine starting circuit, Starter drives-Bendix (torsion, compression), over-running clutch and sliding armature types. Starter switch - manual, solenoid, Factors affecting the starting of engines, Torque terms. Starting torque and power required, Motor efficiency, Armature reaction, Typical motor specifications	08
2	<b>IGNITION SYSTEM OF SPARK-IGNITED ENGINES:</b> Types of ignition systems- battery-and-coil, magneto ignition systems. Ignition circuit. Details of the ignition system-ignition coil, distributor, condenser, contact breaker points, rotor, distributor cap, distributor drive. Firing order. Ignition timing. Ignition advance and retard, need, and factors it depends upon. Methods for obtaining advance and retard vacuum and mechanical. Optical sensor for spark timing.	08
3	Spark plugs-constructional details; types used in automobiles, conditions of working of spark plugs. Glow plugs of diesel engines. Magneto-rotating armature and rotating magnet types. Electronic ignition of cars & motor-cycles (CDI), Idea of Distributor-less Direct ignition system.	08
4	<b>LIGHTING SYSTEM:</b> Requirements of automobile lighting. Head lamp - mounting and construction; Plastic headlamp Lens, sealed beam assembly. Asymmetrical head light, dipper and full beam, care of headlamp, Lens cleaners. Dynamic headlight beam control, Advanced Front lighting system (AFS) Types of bulbs. Reflector optics. Light sources – tungsten light Sources, tungsten halogen light sources, halogen infra-red reflective light sources, HID light sources (Xenon and bi-xenon), LED light sources, Blue vision head lamp. Auxillary lights, Brake light, Fog light, Flasher unit, warning lights and panel lights.	10
5	<b>ACCESSORIES:</b> Fuel and oil pressure gauge, cooling water temperature gauge, electrical speedometer, amperemeter, wind-screen wiper, electrical horn and relay, cigarette lighter, Odometer, wind-shield washing equipment, engine rpm meter, glow plug indicator, cluster assembly. Radio and television Interference suppressors, electrical switches. Central locking of doors, power winding of window panes, car heaters AC, blower and air flow controls, Rear defogger.	08
<b>Total Hours:</b>		<b>42</b>



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Syllabus for Bachelor of Vocation (B.Voc), 3<sup>rd</sup> Semester**  
**Branch: Automobile Servicing**  
**Subject Name: Automobile Electrical System**  
**Subject Code: 1130101**

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

**Suggested Specification table with Marks (Theory):**

<b>Distribution of Theory Marks</b>				
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)

**Reference Books:**

1. Automotive Electrical Equipment: PL Kohli
2. Modern Electrical Equipment: AW Judge