GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 1st Semester
Branch: Automobile Servicing
Subject Name: Automobile Electrical Equipment
Subject Code: 1110102

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	**Automobile Wiring Systems & Cables :** Earth-return and insulated-return systems; 6 Volt, 12 Volt and 24 Volt systems. Positive and negative earthing. Cables-starting systems cables, general purpose cables and hightension cables; specifications and colour codes. Diagram of a typical wiring system. Wiring harness, cable connectors, circuit breakers, plastic fibre-optic wires, printed circuits. Fuses in circuits.	8
2	**Storage Battery:** Principle of lead-acid cells; constructional details of battery plates, separator, container, terminal, vent plug, grouping compound. Electrolyte: specific gravity of electrolyte and its variation with temperature. Effect of charging and discharging of specific gravity. Capacity of battery. Efficiency of battery. Methods of charging of battery. Internal circuit of battery charger. Care and maintenance of batteries. Checking for cell voltage and specific gravity of electrolyte. Battery tests-high discharge test, cranking motor test, open-circuit voltage test, cadmium test, life test. Battery failures, Maintenance-free batteries, VRLA batteries, Traction battery. Alkaline type batteries. Fuel cell and its types, Battery Life enhancer.	10
3	**Dynamo:** Principle of generation of D.C. Constructional details of a Dynamo. Armature reaction. Principle of commutation. Construction of commutator. Types of wound field generatorseries, shunt and compound wound. Other types of D.C. generators-four brush & four pole, interpole, split field and bucking field. Dyna-Starter, Generator drive.	8
4	**Alternator:** Principle of generation of A.C. Constructional details of an alternator. Working of alternators. Advantages over dynamo. Types of alternators. Charging of battery with an alternator. Regulator for alternators.	8
5	**Regulators:** Constant current and constant voltage systems, Double-contact and compensated voltagecontrol regulators. Current-and-voltage regulator, Cut-out.	8
	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. Automotive Electrical Equipment: PL Kohli
2. Modern Electrical Equipment: AW Judge
3. Automotive Electrical Equipment: WH Crouse

Course Outcomes:

This course tries to develop knowledge and skills in the students, which would help them in installation of various electrical components, operation and maintenance of automobile electrical system. Understanding of this course will also be helpful for diagnosis and testing of electrical system.