4063 - AUTO ELECTRICAL EQUIPMENT

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
Lectures	Practical	Credits			Theory		Practical Ex.	Total
3	1	4	25	25	3 Hrs.	100	-	150

Pre-requisite	Source
4054, 4055	

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	25	-	125

Rationale: Every automobile possesses various kind of electrical equipment's, required for the functioning of the vehicle and some times simply as supporting systems to the other main vehicle systems. In the light of this it becomes necessary that an Automobile Engineer should possess the basic knowledge about the identification, function and working of the various electrical equipment employed in an automobile.

COURSE CONTENTS	Hrs	Mks
1. ELECTRICAL SYSTEMS	9	
Basic features and functions of various electrical elements in an automobile. Insulated and earth return system, negative and positive earthing. 6V, 12V, 24V electrical system. Energy demand of various electrical circuits. Types of cables, lighting circuits and switches.		
2. BATTERY	.12	
Lead acid battery, chemical action in Battery voltage, Battery elements, plates, separators, cell connectors, vent plug, sealing components, cell corners, Battery electrolyte and its proportion, Battery rating and capacity, Battery characteristics showing effect of temo. Specific gravity and capacity, Battery tests like Cadmium test, open voltage test, light load test, Battery charging, constant potential, constant current, initial, normal, tricle, and booster charge, Battery maintenance, Cleanliness, topping, Periodical checks, battery storage (dry wet) dismantling methods, overhauling methods, overcharging, cycling, sulphonation, internal short circuits, Brief idea about Ni-Fe, Ni-Cd, Ag-Cd cells, advantages of this over lead acid cells.		
3. CHARGING SYSTEM	12	
Charging system and its various components, their function and working principle, Constructional details and working principle of dynamo. Two brush and shunt dynamo, bucking field, split field and motor dynamo, are and maintenance of dynamo, Two and three unit regulator, heavy duty regulator, compensated curve,		

semiconductor type regulator, regulator adjustments, Selenium rectifiers, working principles of alternators, special precautions for alternators while in action, advantages of alternators, Rectification of alternators. 8

4. STARTING SYSTEM

Working principle of a starter motor, Constructional features of a starter, torque performance curves, Bendix drives, overunning clutches. 7

5. IGNITION SYSTEM

Principle of ignition system, Functional details of the ignition system, Spark plug, their construction and types, Electronic ignition system.

Total	48

PRACTICALS/LABORATORY WORK

1. Study of various components of different types of batteries by opening them.
2. Study of various components of different types of a dynamos, by opening them.
3. Study of various components of different types of a three unit regulator
4. Study of various components of different type of an alternator.
5. Study of various components of different types of ignition system.

REFERENCE BOOKS:

1. Auto electrical system by A.W. Judge
2. Electrical Equipment's by Yang & Gulfith
3. Auto Engines & Electrical system by Blechand