

GANPAT UNIVERSITY

FACULTY OF U. V. PATEL COLLEGE OF ENGINEERING

Programme	Degree Engineering				Branch/Spec.	Automobile Engineering			
Semester	III				Version	1.0.0.0			
Effective from Academic Year	2018-19				Effective for the batch Admitted in	June 2017			
Subject code	2AE302		Subject Name		Automobile Electrical Systems and Electromobile				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	0	1	0	5	Theory	40	60	100
Hours	4	0	2	0	6	Practical	30	20	50

Pre-requisites:

None

Learning Outcome:

Learning Outcomes:

After completion of this course, student will be able to

- The student can identify different areas of automobile electrical and electronics.
- Can find the applications of all the areas in day to day life.
- Students learnt about all EV'S fundamentals and drive systems.

Theory syllabus

Unit	Content	Hrs
1	Automobile Electrical Systems Electrical and electronic principles, Insulator, Conductor and semiconductor, Voltage current and resistance, Measurement of current, Common circuit symbols for automobiles, Series and parallel circuits, Purpose of automotive electrical system, Layout of an electrical system.	4
2	Battery system Various types of automotive batteries. Principles, Construction & working of lead acid battery, Dry battery & Alkaline battery. Designations & Rating of batteries. Performance tests Battery capacity, Efficiency, Gravimetric test and efficiency. Battery failures. Recharging Electronic circuits, Battery charging current, Charging methodology & precautions.	5
3	Starting system Requirement of starting system, Starter motor capacity, Starter system circuits, System layout, Types of starting motor, Starting drives-bendix drives, Over-running clutch drive, Starter switches, Starting system in two wheeler, Auto start circuit in two wheeler.	6
4	Charging system Charging system requirement, Principles of operation of charging system , Types of charging system, DC generator, A.C. generator-operating principle, construction and working, cutout relay, current regulator and voltage regulator.	6
5	Ignition system Requirements. Types of Ignition systems: Ballast Resistance, Ignition coil characteristics, Cam angle & contact angle gap, Spark advance mechanism, Spark plug, Ignition timing, multi-cylinder distributor, Distributor (contact breaker ignition system), Limitations of coil ignition system, Electronic ignition systems. Voltage and current required for Spark.	8
6	Lighting system and Accessories & dashboard instruments Lighting system of vehicle, Head lamp, Tail lamp, Brake lamp, Parking lamp, Reflector purpose and design, Head lamp angle and position, Fog lamp, side indicator lamp, Warning lights and flashers, Instrument panel lights, Body interior lights. Safety indicator lights. Engine compartment & Rear boot lamps, Horns-AC & DC horns, Wind tone horn/air horns, Electronic horn, and reverse horn. Horn relay. Warning Buzzer. Sensors -Instrument cluster panel, Fuel gauges, Oil temperature gauge, Coolant temperature gauge, Speedometer, Odometer, Tachometer, Trip meter, Oil level indicator, Parking brake indicator.	8

7	Electrical Equipments & Accessories Windscreen wipers, Windscreen washers, Power windows, Doors locks, Rear wind shield glass heating system. Rear view mirror adjusting, Day light regulating system. Central locking system. Convertible mechanism.	8
8	Fundamentals of EV'S History of EV'S, Configurations of electric vehicles, Performance of electrical vehicles, Battery types and parameters, Traction batteries, Fundamental machine phenomena, Simple electric machines, DC Machines, Three phase AC machines, Induction machines, Permanent magnet machines, Switched reluctance machines, Power electronic switches, DC/DC convertor, Cell balancing Convertor, Drive use in EV'S.	10
Practical content		
The practical work shall be based on experimental work on the topics mentioned above and will be defended by the candidates.		
Text Books		
1	Automobile Technology by Dr.N.K.Giri, Khanna publishers.	
2	Automobile Engineering-I by P.S. Gill, S.K.katriya and sons	
Reference Books		
1	Automobile Electrical & Electronic Systems, by Tom Denton, Allied Publishers Pvt. ltd., Chennai.	
2	Automotive mechanics by W. Crouse, TMH	
3	Automotive Electrical Equipment, P.L.Kohli, Tata McGraw Hill Education Pvt. Ltd., New Delhi.	