

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Diploma in Automobile Engineering

Semester: 3

**Subject Code**

**Subject Name** AUTOMOBILE ELECTRICAL SYSTEM

Sr. No.	Course content
1.	<b>ELECTRICITY, MAGNETISM AND AUTOMOBILE WIRING :</b> A short history of auto-electrical system, Constructional and functional details of conductors, semi-conductors and insulators, Ohm's Law, EMF, potential difference and voltage drop, Series and parallel circuits, Effect of electric current, Measurement of DC-Current, Voltage, & resistance, Application & principle of Multimeters, Meaning of magnetism and 1 <sup>st</sup> law of magnetism, Symbols used in wiring, Types of wiring system, wiring harness, Different electrical system, Types of bulbs.
2.	<b>AUTOMOBILE BATTERY :</b> Construction of battery, Function of lead acid battery, Various charging processes and chargers, Maintenance of battery, Various tests on battery, Modern developments in battery, Procedure of commissioning of new battery vehicle, The various battery rating, Effects of over charging and under charging of a battery, Battery life and factors affecting battery life.
3.	<b>IGNITION SYSTEM :</b> Types of ignition system and its layouts, Coil ignition system : construction, function Magneto ignition systems : construction, working and types, Capacitor discharge ignition system : construction, function, Comparison of systems, H.T.Coil, :Types, construction and working, Distributor :construction, function, types, Spark plug : construction, function, types, Setting and checking of ignition timing.
4.	<b>AUTOMOBILE STARTERS :</b> Constructional and functional details of starter, Torque characteristic of starter, Starter drive mechanism : its types, construction, function and comparison, Starter Switches
5.	<b>CHARGING SYSTEM :</b> Requirements of charging system, introduction & basic principle of generator, Functions, Circuit arrangement & Working Principle Of Alternator - Charging System, Differences between Generator & Alternator, Advanced charging system technology & new developments, case study of charging system of prevailing modern vehicles
6.	<b>CURRENT &amp; VOLTAGE REGULATORS OF ALTERNATOR :</b> Requirement of regulating current & voltage in alternator, Basic principle of Regulators, Constructional and functional details of regulator, Solid state voltage regulators, Applications of diode, transistors & IC in process of regulation, case study of regulating system of prevailing modern vehicles.

7.	<b>LIGHTING SYSTEM &amp; AUTOMOBILE AUXILIARIES :</b> Lighting Fundamentals, Lighting Circuits, Gas discharge & LED lighting, Meaning of auxiliaries, Construction, function & circuit arrangements of various auxiliary units such as :- Horn , Wiper, Flashers, fuel gauge, temp gauge, oil pressure gauge, warning lights, Mechanical & digital Speedometer, Electrical Fuel Pump , Electrical Fan for cooling system, Wind shield washer & Defogger, car stereo, Dash board tachometer, Car Air-conditioning, Power window, central locking with remote control & without remote control, keyless entry, Modern security system of car.
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### **SUGGESTIVE LIST OF LABORATORY EXPERIMENTS :**

1. Demonstration of cable size, color code, wiring and symbols used in auto wiring
2. Demonstration of construction and working of automobile batteries
3. Demonstration of different types of ignition systems
4. Demonstration of different types of starter, motor, its drive and switches
5. Demonstration of A.C. generator and its regulators
6. Demonstration of Power window, central locking & Security system.
7. Demonstration of automobile bulbs and lights.
8. Demonstration of various instruments & gauges (Dash board units).
9. Demonstration of various electrical accessories e.g. horn, wiper & flashers etc.

### **Reference Books:**

Sr.No.	Name of Book	Author
1.	Automotive Mechanics	W. H. Crouse and D. L. Anglin
2.	Elements of Automotive Mechanics	Joseph Heitner
3.	Automobile Engineering	R. B. Gupta
4.	Automobile Technology	H. M. Sheti
5.	Automobile Engineering	G. B. S. Narang
6.	Motor Vehicle Technology	Newton Steeds
7.	Automobile Electrical Equipments	P. L. Kholi
8.	Automobile Electrical & Electronic system	Tom Denton
9.	Automobile Engineering	K. M. Gupta
10.	Motor Automotive Technology	Anthony E. Schwaller
11.	Automotive diagnosis And Tune up	johnson