



J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD, HARYANA, (INDIA)

A State Government University (Accredited 'A+' Grade by NAAC)
(Established by Haryana State Legislative Act No. 21 of 2009, Recognized by U.G.C. u/s 2 (f) and 12(B) of U.G.C. Act 1956)
SECTOR-6, MATHURA ROAD, FARIDABAD-121006, HARYANA, (INDIA)

Community College of Skill Development

Lesson Plan: AUTOMOBILE ELECTRICAL ELECTRONICS

Program: B.VOC AUTOMOBILE

Semester: IIrd

Course Code: AMV-207-V

Credits: 3

Course Objectives: The course should enable the students to understand the basics of batteries, used for electrical components of automobiles, electrical components of automobiles, and the electrical wiring and lighting

Course Outcomes: At the end of the course, the student shall be able to:

CO1: Analyze the principles, construction, and characteristics of various types of batteries used in automotive applications, including lead-acid, nickel-cadmium, and lithium ion batteries.

CO2: Evaluate the components and functioning of automotive electrical systems, including starter motors, generators, alternators, and ignition systems.

CO3: Assess the operation and control strategies of electronic ignition systems, including capacitive discharge ignition (CDI) and distributor-less ignition systems (DIS).

CO4: Examine automotive wiring, lighting systems, and dashboard instruments, understanding their construction, operation, and wiring circuits. **Equipment required in Classroom/ Laboratory/ Workshop**

- i. Whiteboard

Assessment Scheme

S.No.	Criteria	Marks
1	End Term Examination	75
2	Internal Evaluation Scheme	25
2a	Class Tests	15

2a (i)	Class Test-I	7.5
2a (ii)	Class Test-II	7.5
2(b)	Teacher Assessment (Continuous Evaluation)	10
2b (i)	Attendance	5
2b (ii)	Assignment / Presentation	5

Lecture No.	Topic Covered	Pedagogy	Date of Implementation	Course Outcomes Covered	Faculty Sign
1	Introduction to Batteries: Purpose, classification, and general requirements in automobiles	Whiteboard	30-7-25	CO1	VINOD
2	Principle and Construction of Lead Acid Battery	Whiteboard	1-8-25	CO1	VINOD
3	Principle and Construction of Nickel–Cadmium Battery	Whiteboard	1-8-25	CO1	VINOD
4	Nickel Metal Hybrid Battery – principle, construction, and applications	Whiteboard	6-8-25	CO1	VINOD
5	Sodium Sulphur Battery and Aluminum Air Battery – characteristics and comparison	Whiteboard	13-8-25	CO1	VINOD
6	Battery Characteristics: Voltage, current, capacity, efficiency	Whiteboard	20-8-25	CO1	VINOD
7	Battery Tests: Discharge, charge, and capacity testing; Battery Charging Techniques	Whiteboard	22-8-25	CO1	VINOD
8	Maintenance of Batteries: Common faults, care, and preventive maintenance	Whiteboard	22-8-25	CO1	VINOD
9	Introduction to automotive electrical components and starter motor requirements	Whiteboard	27-8-25	CO2	VINOD
10	Starter Motors: Types, construction, and characteristics	Whiteboard	29-8-25	CO2	VINOD
11	Starter Drive Mechanisms:	Whiteboard	29-8-25	CO2	VINOD

	Bendix drive, overrunning clutch, and solenoids				
12	Starter Switches and Solenoids: Operation and control circuits	Whiteboard	3-9-25	CO2	VINOD
13	Charging System Components: Overview of generators and alternators	Whiteboard	5-9-25	CO2	VINOD
14	DC Generators: Types, construction, working, and characteristics	Whiteboard	5-9-25	CO2	VINOD
15	AC Alternators: Single-phase and three-phase alternators, construction and operation	Whiteboard	10-9-25	CO2	VINOD
16	Voltage and Current Regulation: Cut-out relays, regulators, and charging circuits	Whiteboard	12-9-25	CO2	VINOD
17	Summary, troubleshooting, and maintenance of starting and charging systems	Whiteboard	12-9-25	CO2	VINOD
18	Introduction to Ignition Systems and their function	Whiteboard	17-9-25	CO2	VINOD
19	Battery Coil Ignition System: Circuit details and working	Whiteboard	19-9-25	CO2	VINOD
20	Magneto Ignition System: Construction, working, and circuit diagram	Whiteboard	19-9-25	CO2	VINOD
21	Advance Mechanisms: Centrifugal and vacuum advance systems	Whiteboard	3-10-25	CO2	VINOD
22	Spark Plugs: Construction, types, and heat range	Whiteboard	3-10-25	CO2	VINOD
23	Ignition System Components: Coils, condensers, distributors	Whiteboard	8-10-25	CO2	VINOD
24	Summary and comparison of ignition systems	Whiteboard	15-10-25	CO2	VINOD
25	Electronically-Assisted Ignition Systems: Need and advantages	Whiteboard	17-10-25	CO3	VINOD
26	Full Electronic Ignition Systems: Principle and working	Whiteboard	17-10-25	CO3	VINOD

27	Non-Contact Type Ignition Systems: Hall effect and optical triggering devices	Whiteboard	29-10-25	CO3	VINOD
28	Capacitive Discharge Ignition (CDI) Systems: Circuit and operation	Whiteboard	29-10-25	CO3	VINOD
29	Distributor-less Ignition Systems: Coil-on-plug technology	Whiteboard	31-10-25	CO3	VINOD
30	Digital Ignition Systems: Microprocessor control and sensors	Whiteboard	31-10-25	CO3	VINOD
31	Control Strategies: Electronic ignition timing and spark control	Whiteboard	7-11-25	CO3	VINOD
32	Troubleshooting and Diagnostics of modern ignition systems	Whiteboard	7-11-25	CO3	VINOD
33	Automotive Wiring Systems: Insulated and earth return systems	Whiteboard	12-11-25	CO4	VINOD
34	Positive and Negative Earth Systems and wiring layouts	Whiteboard	12-11-25	CO4	VINOD
35	Lighting Systems: Headlamp, indicator lamp, anti-dazzling and dipper mechanisms	Whiteboard	14-11-25	CO4	VINOD
36	Electrical & Electronic Fuel Lift Pumps: Construction and operation	Whiteboard	14-11-25	CO4	VINOD
37	Dashboard Instruments: Speedometer, odometer, fuel gauge	Whiteboard	26-11-25	CO4	VINOD
38	Sensors: Oil pressure, coolant temperature, and other sensors	Whiteboard	26-11-25	CO4	VINOD
39	Horns and Wiper Mechanisms: Working principles and types	Whiteboard	28-11-25	CO4	VINOD
40	Automotive Wiring Circuits: Fault finding, color coding, and system integration	Whiteboard	28-11-25	CO4	VINOD

Text Books:

1. Young, A.P. and Griffith, S.L., Automobile Electrical Equipment, ELBS and New Press.
2. Kohli.P.L. Automotive Electrical Equipment, Tata McGraw-Hill co Ltd, New Delhi,2004
3. Automotive Electricals and Electronics, A. K