



Department of Automobile Engineering		LP: AE22402
B.E/B.Tech/M.E/M.Tech : Automobile Engineering	Regulation: R2022	Rev. No: 00
PG Specialisation : NA		Date: 24.01.2024
Sub. Code / Sub. Name : AE22402 - AUTOMOTIVE ELECTRICAL, ELECTRONICS AND MICROCONTROLLER SYSTEMS		
Unit : I		

Unit Syllabus: INTRODUCTION TO ELECTRICAL AND ELECTRONICS ACCESSORIES

Basic electrical principles, electronic components and circuits, digital electronics, microprocessor systems, electrical wiring, terminals and switching, multiplexed wiring systems, circuit diagrams and symbols, dashboard instruments, horn, trafficator.

Objective: To make the students to know the working of electrical and electronic systems.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Basic electrical principles	4, Ch. 2, Pg. 11-55	PPT
2	Electronic components and circuits, digital electronics	4, Ch. 2, Pg. 11-55	PPT
3	Microprocessor systems	4, Ch. 2, Pg. 11-55	PPT
4	Electrical wiring, terminals and switching	4, Ch. 4, Pg. 83-91	PPT
5	Horn, trafficator	4, Ch. 4, Pg. 91-97	PPT
6	Multiplexed wiring systems in Automotive Wiring systems	4, Ch. 4, Pg. 82-108	PPT
7	Multiplexed wiring systems circuit diagrams and symbols	4, Ch. 4, Pg. 82-108	PPT
8	Dashboard instruments	4, Ch. 4, Pg. 82-108	PPT
9	Horn, trafficator	4, Ch. 4, Pg. 82-108	PPT
Content beyond syllabus covered (if any):			

* Session duration: 50 minutes



Sub. Code / Sub. Name: **AE22402 - Automotive Electrical, Electronics And Microcontroller Systems**

Unit : **II**

Unit Syllabus: STARTING SYSTEM, CHARGING SYSTEM, LIGHTING SYSTEM

Starter motor characteristics, drive mechanisms. DC Generators, Alternators and their characteristics, electronic regulators. Vehicle interior lighting system, vehicle exterior lighting system, lighting design.

Objective: To understand the working of starting system, charging system of an engine for smooth operation.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Starter motor characteristics	4, Ch. 7, Pg. 149-168	PPT
11	Types of Drive mechanisms	4, Ch. 7, Pg. 149-168	PPT
12	Types of Drive mechanisms	4, Ch. 7, Pg. 149-168	PPT
13	DC Generators	4, Ch. 7, Pg. 149-168	PPT
14	Alternators and their characteristics	4, Ch. 7, Pg. 149-168	PPT
15	Electronic regulators	4, Ch. 6, Pg. 128-148	PPT
16	Vehicle interior lighting system	4, Ch. 6, Pg. 128-148	PPT
17	Vehicle exterior lighting system	4, Ch. 11, Pg. 219-315	PPT
18	Lighting design	4, Ch. 11, Pg. 219-315	PPT
Content beyond syllabus covered (if any):			

* Session duration: 50 mins



Sub. Code / Sub. Name: **AE22402 - Automotive Electrical, Electronics And Microcontroller Systems**

Unit : **III**

Unit Syllabus: ELECTRONIC IGNITION AND INJECTION SYSTEM

Spark plugs, advance mechanisms, different types of ignition systems, Electronic fuel injection systems, mono and multi point fuel injection system.

Objective: To understand the working of ignition and injection system of an engine.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Working of Spark plugs	4, Ch. 8, Pg. 170-197	PPT
20	Advance mechanisms	4, Ch. 8, Pg. 170-197	PPT
21	Mechanical ignition systems	4, Ch. 8, Pg. 170-197	PPT
22	Electronic ignition system	4, Ch. 8, Pg. 170-197	PPT
23	Electronic ignition system	4, Ch. 8, Pg. 170-197	PPT
24	Electronic fuel injection systems	4, Ch. 9, Pg. 199-238	PPT
25	Mono fuel injection system	4, Ch. 9, Pg. 199-238	PPT
26	Multi point fuel injection system	4, Ch. 9, Pg. 199-238	PPT
27	CRDI system	4, Ch. 9, Pg. 199-238	PPT

Content beyond syllabus covered (if any):

* Session duration: 50 mins



Sub. Code / Sub. Name: **AE22402 - Automotive Electrical, Electronics And Microcontroller Systems**

Unit : **IV**

Unit Syllabus: SENSORS AND MICROPROCESSORS IN AUTOMOBILES

Basic sensor arrangements, Types of sensors – oxygen sensor, hot wire anemometer sensor, vehicle speed sensor, detonation sensor, accelerometer sensor, crank position sensor, Microprocessor and microcomputer controlled devices in automobiles such as voice warning system, travel information system, keyless entry system, electronic steering system.

Objective: To enhance the knowledge of sensor and microprocessor applications in vehicle control systems.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Basic sensor arrangements in vehicles	4, Ch. 2, Pg. 11-55	PPT
29	Types of sensors – oxygen sensor	4, Ch. 2, Pg. 11-55	PPT
30	hot wire anemometer sensor	4, Ch. 2, Pg. 11-55	PPT
31	vehicle speed sensor, detonation sensor	4, Ch. 2, Pg. 11-55	PPT
32	accelerometer sensor, crank position sensor	4, Ch. 2, Pg. 11-55	PPT
33	Microprocessor and microcomputer controlled devices in automobiles	4, Ch. 15, Pg. 370-	PPT
34	Voice warning system	4, Ch. 15, Pg. 370-	PPT
35	Travel information system, Keyless entry system	4, Ch. 15, Pg. 370-	PPT
36	Electronic steering system	4, Ch. 15, Pg. 370-	PPT
Content beyond syllabus covered (if any):			

* Session duration: 50 mins



Sub. Code / Sub. Name: **AE22402 - Automotive Electrical, Electronics And Microcontroller Systems**

Unit : V

Unit Syllabus: SAFETY SYSTEMS

Antilock braking system, air bag restraint system, voice warning system, seat belt system, road navigation system, anti theft system.

Objective: To gain knowledge in modern safety systems.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Antilock braking system	4, Ch. 16, Pg. 403-441	PPT
38	Antilock braking system	4, Ch. 16, Pg. 403-441	PPT
39	Air bag restraint system	4, Ch. 16, Pg. 403-441	PPT
40	Air bag restraint system	4, Ch. 16, Pg. 403-441	PPT
41	Voice warning system	4, Ch. 16, Pg. 403-441	PPT
42	Voice warning system	4, Ch. 16, Pg. 403-441	PPT
43	Seat belt system,	4, Ch. 16, Pg. 403-441	PPT
44	Seat belt system	4, Ch. 16, Pg. 403-441	PPT
45	Anti theft system	4, Ch. 16, Pg. 403-441	PPT
Content beyond syllabus covered (if any):			


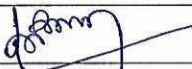
* Session duration: 50 mins



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REFERENCES:

1. Judge A.W, "Modern Electrical Equipment of Automobiles", Chapman &Hall, London, 1992.
2. William Ribbens, "Understanding Automotive Electronics", 8th Edition, ButterworthHeinemann, 2017.
3. Crouse W.H, "Automobile Electrical Equipment", Mc Graw Hill Book Co Inc. NewYork, 2005.
4. Tom Denton, "Automotive Electrical and Electronics Systems", 5th edition, Routledge, 2017.
5. Young A.P, & Griffiths L, "Automobile Electrical Equipment", English Language Book Society & New Press, 1990.

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Date	24.01.2024	24.01.2024
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD