

COURSE TITLE : AUTO ELECTRICAL LAB
COURSE CODE : 4056
COURSE CATEGORY : B
PERIODS/WEEK : 3
PERIODS/SEMESTER : 42
CREDITS : 2

TIME SCHEDULE

Module	Topic	Periods
1	Recognize Automobile Batteries – Lead Acid Cells	9
2	Locate complete wiring of passenger cars, commercial vehicles	11
3	Test Dynamo & Alternator	8
4	Locate the Wiring of Ignition System Locate Accessories and Lights	14
TOTAL		42

GENERAL COURSE OUTCOME

Module	G.O	Student will be able to
1	1	Understand the constructional features of head acid battery
	2	Perform various tests on head Acid Battery
	3	Prepare electrolyte and charge batteries
	4	Detect the faults in wiring/circuits of automobiles
	5	Analyse, and specify different colour codes of Automobile cables
	6	Calculate power consumption of different accessories and voltage of bulbs.
	7	Adjust and aim the head lights
2	1	Perform various tests on dynamo, alternator and starter motor.
	2	Detect the faults in regulators
	3	Detect the fault in drive mechanism of starter motor
3	1	Apply the use of stroboscope in setting ignition timing in cars.
	2	Detect faults in wiring circuit of power windows, central locking system and in-car infotainment system

SPECIFIC COURSE OUTCOME

MODULE I

1.1.0 Recognize Automobile Batteries – Lead Acid Cells

- 1.1.1 Prepare Electrolyte
- 1.1.2 Charge batteries, care and maintenance of storage batteries
- 1.1.3 Test battery by
 - 1. Cell tester (High rate discharge test)
 - 2. Hydrometer (Specific gravity test)
- 1.1.4 Test battery for voltage – open volt test – polarity test

MODULE II

2.1.0 Locate complete wiring of passenger cars, commercial vehicles

- 2.1.1 Familiarize wiring circuits in various vehicles– colour codes – cable Specifications- wiring harness
- 2.1.2 Adjust and aim head lights
- 2.1.3 Use of relay in head light circuit
- 2.1.4 Wiring circuit through combination switch
- 2.1.5 Test electrical & electronic type flashers and its wiring connections
- 2.1.6 Locate instrument panel wiring. Connections to gauges and meters
- 2.1.7 Locate fuse box and wiring connections to accessories
- 2.1.8 Compute power consumption of different accessories and wattage of bulbs

MODULE III

3.1.0 Test Dynamo & Alternator

- 3.1.1 Dismantle & clean commutator & brushes
- 3.1.2 Test for continuity of field coils – test for motoring action
- 3.1.3 Test armature on growler
- 3.1.4 Study of alternator regulators
- 3.1.5 Dismantling and assembling of starter motor
- 3.1.6 Dismantle & check drive mechanism of starter motors
- 3.1.7 Test solenoid switch
- 3.1.8 Discover wiring connection of starting system & charging system
- 3.1.9 Testing of starter motor and alternator

MODULE IV

4.1.0 Locate the Wiring of Ignition System

- 4.1.1 Locate faults in wiring of ignition system
- 4.1.2 Test ignition coil (Primary & secondary) for continuity and voltage
- 4.1.3 Test for condenser & C.B. points – use of dwell meter
- 4.1.4 Spark plug- removal, cleaning & gap resetting
- 4.1.5 Discover wiring in magneto ignition system
- 4.1.6 Use of Stroboscope in ignition timing in cars
- 4.1.7 Analyze pattern of ignition using Oscilloscope

4.2.0 Locate accessories and lights

- 4.2.1 Point out wiring connections to lights & accessories
- 4.2.2 Trouble shooting of horn and check for correct contact – testing of horn relay
- 4.2.3 Wiring circuit for three speed wiper motor
- 4.2.4 Trouble shooting of wiper motor assembly – test motor field winding – inspect wiper gear assembly – removal of wiper blades
- 4.2.5 Wiring circuit for central locking systems
- 4.2.6 Wiring circuit for power windows
- 4.2.7 Wiring circuit for in-car infotainment system
- 4.5.8 Wiring circuit for car A/C climate control system

CONTENT DETAILS

CYCLE-1

1. Test battery by
 - a. Cell tester (High rate discharge test)
 - b. Hydrometer (Specific gravity test)
 - c. Open volt test
 - d. Polarity test

CYCLE-2

1. Complete wiring of passenger cars and commercial vehicles
2. Wiring circuit for head light with and without relay and combination switch.
3. Wiring circuit for instrument panel with and without fuse unit
4. Wiring circuit for indicator lamps, brake light and park lamps

CYCLE-3

1. Testing and checking of starter motor and alternator
2. Wiring connection of starting system & charging system

CYCLE-4

1. Wiring circuit of ignition system
2. Testing of ignition system components
3. Use of Stroboscope in ignition timing in cars
4. Wiring circuit for three speed wiper motor,
5. Wiring circuit for horn with relay
6. Wiring circuit for centre locking systems
7. Wiring circuit for power windows
8. Wiring circuit for in-car infotainment system

REFERENCE:

1. A W.Judge -Auto electrical equipments - London : Chapman & Hall
2. Kohli -Automobile electrical equipments - McGraw- Hill