

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Diploma Engineering				Branch	Automobile Engineering			
Semester	VI				Version	1.0.0.0			
Effective from Academic Year		2020-21			Effective for the batch Admitted in			July 2018	
Subject code		1AU2603			Subject Name		AUTOMOTIVE ELCTRICAL SYSTEM IN DIAGNOSIS AND TESTING		
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

Course Learning Outcomes:
The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes: CO1. Identify various auto-electrical faults/troubles and their causes. CO2. Analyse and rectify various auto-electrical troubles with the help of troubleshooting charts CO 3.Use standard acceptance test with the help of service manuals CO 4.Use suitable instrument and tools for diagnosis and testing of automotive electrical system. CO 5.Follow safety rules for repair and maintenance of various automotive electrical systems and units.

Course Content						
Name of UNIT	Unit Content		Unit Learning Outcomes		Marks	Hrs
UNIT – 1 Automobile Battery	1.1	Different troubles Causes and remedies of the battery	1a.	Explain different tests carried out on battery.	12	8
	1.2	Symptoms and effects of various battery failures	1b.	Identify various troubles & its causes & remedies.		
	1.3	Different battery tests	1c.	Explain charging of the battery.		
	1.4	Determination of battery condition and serviceability				
	1.5	Battery charging				
	1.6	Method of using battery tester				
	1.7	Periodical checking of the automobile battery				
UNIT – 2 Ignition system	2.1	Different ignition failures, their causes and remedies	2a.	Explain tests carried out on the component of the ignition system.	12	8
	2.2	Quick checking of ignition system	2b.	Identify various ignition failure, its causes & remedies.		
	2.3	Ignition service	2c.	Explain servicing & adjustment of the ignition		
	2.4	Testing of different ignition system components by using different types of testing equipments (ignition coil tester,				

	<p>condenser tester, distributor tester, cam angle and RPM tester, ignition timing device)</p> <p>2.5 Procedure of checking and setting of ignition timing</p> <p>2.6 Use of oscilloscope ignition tester for diagnosis of ignition trouble</p> <p>2.7 Testing of the transistorized ignition system and their components</p> <p>2.8 Servicing testing and adjustment of the fly wheel magneto ignition system</p> <p>2.9 Periodical checking of the automobile ignition system</p>	<p>system timing & components.</p> <p>2d. Explain method of using various tester</p>		
<p>UNIT – 3 Starter Motor and its circuit</p>	<p>3.1 Common troubles Causes and remedies in starter motor and its drive mechanism</p> <p>3.2 Maintenance of the starter motor and its circuits</p> <p>3.3 Reconditioning of the starter motor</p> <p>3.4 Different starter tests and interpretation of the results</p> <p>3.5 Testing of the starter switches</p> <p>3.6 Method of using growler for starters</p>	<p>3a Explain various starter motor failure, causes & remedies.</p> <p>3b Explain various tests on the starter motor.</p> <p>3c Describe maintenance & reconditioning of the starter motor.</p>	6	5
<p>UNIT – 4 Alternator and Regulators</p>	<p>4.1 Different troubles in alternator, their causes and remedies</p> <p>4.2 Testing procedure of alternator components</p> <p>4.3 Testing procedure of regulator</p> <p>4.4 Precautions to be observed in the use of alternator and regulator</p> <p>4.5 Maintenance of alternator and regulator</p> <p>4.6 Periodical checking of the automobile alternator</p>	<p>4a Explain various tests on the alternator & regulator</p> <p>4b Explain various regulator & alternator failure causes & remedies.</p> <p>4c Describe maintenance & reconditioning of the alternator.</p>	8	5
<p>UNIT – 5 Indicating and Warning Devices</p>	<p>5.1 Troubles Causes and remedies in fuel level gauge and its circuits</p> <p>5.2 Procedure of testing gauge and tank units</p> <p>5.3 Troubles shooting of water temperature gaug</p> <p>5.4 Troubles shooting of oil pressure gauge</p> <p>5.5 Common troubles Causes and</p>	<p>5a Describe Procedure of testing the various indicating & warning devices.</p> <p>5b Describe troubles & ways for service of the various warning & indicating devices in the automobiles.</p>	8	5

	remedies in speedometer and odometer 5.6 Troubles, causes and remedies in flasher unit 5.7 Periodical checking of indicating and warning devices			
UNIT – 6 Wiring - Installation and Lighting & Miscellaneous Electrical Equipment	6.1 Troubles Causes and remedies in auto vehicle wiring 6.2 Testing of broken cable 6.3 Types of deterioration of cables, its causes and their remedies 6.4 Faults in the Automobile lighting circuits 6.5 Causes and remedies for various troubles 6.6 Method of focussing the head light 6.7 Troubles Possible causes and remedies in wind shield wiper and its circuit 6.8 Troubles Probable causes and remedies in electric horn (high frequency) relay and its circuit 6.9 Method of replacement of the horn components 6.10 Troubles shooting of electric fuel pumps 6.11 Troubles, causes and remedies in power window operating system	6a Identify various problems in the wiring & repair it 6b Describe testing Procedure of various electrical equipment. 6c Describe troubles & service of the various lighting & electrical equipment.	14	14
		Total	60	45

List of Practical		
No.	Unit	Name of Practical
1	I	Test an automobile battery for its serviceability
2	II	Test ignition coil, condenser, dwell angle, etc.
3	II	Set and check ignition timing of S.I. engine.
4	III	Test starter motor and its circuit for voltage drop, no-load and torque.
5	III	Test starter motor component.
6	IV	Test alternator and its components.
7	IV	Test output of alternator.
8	V	Test various indicating and warning devices.
9	V	Set and adjust head light of the automotive vehicle.
List of Instruments/Equipment/TrainerBoard		
1	Battery load tester, Hydrometer	
2	Onboard ignition system	
3	Onboard Starter motor	
4	Auto electrical test bench	
5	Set of Headlights	

Link of Text Books			
No	Title of Books	Authors	Publication
1	Automobile Electrical Equipments	P. L. Kholi	Tata McGraw Hill
2	Automobile Electrical & Electronic system	Tom Denton	Elsevier Butterworth-Heinemann
3	Automotive Electrical equipment	W.H.Crouse & D.L. Anglin	Tata McGraw Hill
List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Auto Electrical Systems	C. P. Nakra	Dhanpat Rai Publication
2	Automotive Electrical maintenance	A. W. Judge	Sir Isaac Pitman & Sons
3	Automotive diagnosis And Tune up	J A Johnson	Tata McGraw Hill
4	Automobile Engineering	R. B. Gupta	Satya Prakashan
Link of Learning Web Resource			
1	http://www.youtube.com/watch?v=3QiKyjWWiRo		
2	https://www.youtube.com/watch?v=1FQMajuQ6j4&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=9		
3	http://www.youtube.com/watch?v=c1zhgsnyZWw		
4	https://www.youtube.com/watch?v=vG3Lzr-ISYg&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=1		
5	http://www.youtube.com/watch?v=Wwp9rtTPPJc		
6	https://www.youtube.com/watch?v=slrZafT8yNg&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=8		
7	http://www.youtube.com/watch?v=wifTHbb06_I		
8	https://www.youtube.com/watch?v=skT2u6kmSP8&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=7		
9	http://www.youtube.com/watch?v=UnmnWuuLfzE		
10	https://www.youtube.com/watch?v=FBuVYi-zlQ4&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=6		
11	http://www.youtube.com/watch?v=9PWG6ll_ZJI		
12	https://www.youtube.com/watch?v=V-2LSJYQkeU&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=4		
13	http://www.youtube.com/watch?v=Bzz7P3qNHcE		
14	https://www.youtube.com/watch?v=uelF_CjtJ5g&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=5		
15	http://www.youtube.com/watch?v=-a0szYkjo9k		
16	https://www.youtube.com/watch?v=xoBXdGAgqTk&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=3		
17	http://www.youtube.com/watch?v=ni6-NhH6uAE		
18	https://www.youtube.com/watch?v=EAqfAzAKYYU&list=PLPvqVA0h0J6h6aYnH2Spw-n7SK5OYXlpj&index=2		