

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	1AU2601		Subject Name		AUTO ENGINES 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:
<p>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: Students will be able to:</p> <p>CO1. Identify and diagnose the causes of malfunctioning of an engine</p> <p>CO2. Rectify engine troubles based on symptoms and causes</p> <p>CO 3. Use the suitable instrument and tools for diagnosis and testing of automotive engine systems</p> <p>CO 4. Remove engine from automobile, disassemble and rectify faults.</p> <p>CO 5. Develop an attitude of relying on systematic method of working using standard trouble shooting procedure rather than taking ad-hoc decisions.</p>

Course Content					
Name of UNIT	Unit Content		Unit Learning Outcomes	Marks	Hrs.
UNIT – 1 Tools and Techniques for maintaining Automobile Engine System.	1.1	Describe tools & instruments for automobile engines maintenance.	1a. Engine Maintenance Tools and instruments. - General and Special Tools. - Measuring Tools and Instruments.	5	5
	1.2	Explain step by step procedure for dismantling and cleaning of engine.	1b. Engine removal preparation and procedure. 1c. Upper engine Disassembly and cleaning. 1d. Lower engine Disassembly and cleaning.		
UNIT – 2 Inspection, Testing and Reconditioning of Engine Components	2.1	Explain various tests for testing the automobile engines.	2a. Different Engine tests like, compression test, vacuum test, cylinder leakage test etc.	12	9
	2.2	Describe Engine troubles and their causes and remedies	2b. Inspection of different engine components.		
	2.3	Explain Reconditioning/rectifying and replacement of different engine components.	2c. Types of defects (troubles), likely to occur in different engine components and		

		<p>their analysis.</p> <p>2d. Causes and remedies for different troubles in engine components.</p> <p>2e. Reconditioning methods (Grinding, Boring, Honing and Lapping) of different engine components.</p> <p>2f. Replacement procedure of different engine components.</p>		
<p>UNIT – 3 Inspection, Service and Repair of Fuel System Components for Petrol & Diesel Engines.</p>	<p>3.1 Explain servicing of different fuel system components.</p> <p>3.2 Explain the Service of the air and fuel filters.</p> <p>3.3 Apply knowledge of fuel system parts/ assemblies Carburettor system, MPFI, LPG & CNG system to solve problems</p> <p>3.4 Explain testing of fuel injectors and nozzles</p> <p>3.5 Explain calibration and servicing of fuel pump.</p> <p>3.6 Explain replacement of fuel filters, bleeding of fuel feed system etc.</p>	<p>3a. Inspection, repair and service of fuel tank, fuel lines and fuel filters.</p> <p>3b. Inspection, repair, testing and service of fuel pump.</p> <p>3c. Carburettor cleaning, servicing and adjustment.</p> <p>3d. Servicing of Air cleaners.</p> <p>3e. Inspection, repair and service of petrol injection system (MPFI).</p> <p>3f. Inspection, repair and service of LPG/CNG system.</p> <p>3g. Testing and adjustment of fuel injectors and nozzles.</p> <p>3h. Calibration and phasing of fuel injection pump.</p> <p>3i. Servicing of the fuel feed pump.</p> <p>3j. Procedure of checking and setting of governors.</p> <p>3k. Checking and setting of injection timing.</p> <p>3l. Replacement of the fuel filters/elements.</p> <p>3m. Bleeding of the diesel fuel feed system.</p>	13	9
<p>UNIT – 4 Servicing, Maintenance and Overhauling of Cooling & Lubricating System.</p>	<p>4.1 Explain engine overheating causes.</p> <p>4.2 Describe Repair of cooling system leakage</p> <p>4.3 Explain Service/ Inspection, servicing and testing of water pump, thermostat valve, fan belt etc.</p> <p>4.4 Justify oil change at prescribed interval.</p> <p>4.5 Explain causes for deterioration of engine oil, excess consumption of oil, etc.</p> <p>4.6 Explain servicing of various</p>	<p>4a. Causes of engine overheating.</p> <p>4b. Servicing of the radiator and water jacket.</p> <p>4c. Detection and repairs of leakage in the radiator and cooling system.</p> <p>4d. Repairs, maintenance and overhauling of water pump.</p> <p>4e. Testing of thermostat valve.</p> <p>4f. Defects in the cooling system components, their causes and remedies.</p> <p>4g. Checking and testing of the lubricating system.</p>	12	8

	components of lubricating system.	4h. Servicing of oil pump and relief valve. 4i. Deterioration of Engine oil. 4j. Excessive oil consumption. 4k. Low and high oil pressure. 4l. Necessity of oil & filter change and its interval. 4m. Servicing and replacement of the oil.		
UNIT – 5 Engine Trouble Shooting.	5.1 Describe engine diagnostic equipment & tools, 5.2 Describe various engine symptoms, troubles and their causes 5.3 Apply knowledge of engines repairs for solving troubles. 5.4 Explain decarbonising, major & minor engine tune-up, overhauling of engines, etc.	5a. Diagnostic equipment scans tools. 5b. Causes for the different troubles and their remedial measures. 5c. Procedure of decarburizing of the engine. 5d. Procedure of major and minor TuneUp. 5e. Difference between major and minor overhaul of the engine.	8	6
UNIT – 6 Engine Performance Testing.	6.1 Explain various testing equipment. 6.2 Compute performance of engine using measured parameters. 6.3 Prepare and interpret Graphical representation to get relationship of different parameters pertaining to IC engine	6a.Types of dynamometer, working principle, merits and limitations. 6b. Engine power measurements and related terms. 6c. Determination of I.H.P., B.H.P., F.H.P. and torque. 6d. Computation of various efficiencies, mean effective pressure, specific fuel consumption. 6e. Plotting of the graphs and interpretation of the data from the graph. 6f. Morse Test on I.C. Engine.	10	8
		Total	60	45

List of Practical		
No.	Unit	Name of Practical
1	2	Demonstration of cylinder boring and honing
2	2	Demonstration of connecting rod alignment
3	2	Inspection and reconditioning of crankshaft
4	2	Demonstration of inspection and re-conditioning of valves and valve seat
5	3	Perform calibration and phasing of fuel injection pump
6	3	Perform service and testing of injectors
7	3	To perform testing and maintenance of LPG/CNG system.
8	4	To perform Servicing of cooling system
9	4	To perform Servicing of lubrication system
10	5	To perform Engine tune up

11	5	To perform Diagnosis of engine by scan tools	
12	6	To perform Testing of I.C. engine	
13	6	To perform Testing and setting of petrol injection system	
14	6	Demonstration of fuel consumption test on automobiles	
List of Instruments/Equipment/Trainer Board			
1	Tool Box (2 sets at least for Intake of 60 students.)		
2	Measuring instruments and gages like Vernier calliper, Micrometre, Filler gauge, Thread gauge etc.		
3	Calibration apparatus for fuel injector		
4	Calibration apparatus for fuel injection pump		
5	Dynamometer		
6	Morse Test Apparatus		
7	. Various charts for safety slogan, servicing & overhauling of various systems of Automobile Engine.		
Link of Text Books			
No	Title of Books	Authors	Publication
1	Automobile Engineering	R. B. Gupta	Satya Prakashan, New Delhi
2	Automotive maintenance and trouble shooting	Ernest A. Venk , Edward Dale Spicer & Irving Augustus Frazee	American Technical Society
3	Automotive Service: Inspection, Maintenance, Repair	Tim Gills	Cengage Learning, 2011
List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Automotive Mechanics	W.H.Crouse & D.L. Anglin	Tata Mc-Graw Hill Publishing Co. Ltd.-New Delhi
2	Maintenance Engineering And Management	R.C. Mishra, K. Pathak	PHI Learning Pvt. Ltd., 2004
3	Diesel Engine Mechanics	C.P. Nakra	Dhanpat Rai Publication Co. (P) Ltd.
4	Automotive Technology	N.K.Giri	Khanna Publication Co. (P) Ltd
Link of Learning Web Resource			
1	https://www.youtube.com/watch?v=ZqJlaXXLAvs		
2	https://www.youtube.com/watch?v=P3ugoKz1dLA&index=5&list=PLPvqVA0h0J6h_KZG_XW0cYwcTZJU22Vkb		
3	https://www.youtube.com/watch?v=Yz-zh3N6AOo		
4	https://www.youtube.com/watch?v=pLNgEdJ2dvl&index=4&list=PLPvqVA0h0J6h_KZG_XW0cYwcTZJU22Vkb		
5	https://www.youtube.com/watch?v=xbIY-2XoJxw		
6	https://www.youtube.com/watch?v=PAR5xFWCTfg		
7	http://www.youtube.com/watch?v=PAR5xFWCTfg		
8	https://www.youtube.com/watch?v=g-cHvRI7n0k&index=3&list=PLPvqVA0h0J6h_KZG_XW0cYwcTZJU22Vkb		
9	http://www.youtube.com/watch?v=jeRqmggQVOS		
10	https://www.youtube.com/watch?v=1Eko94ch65Y&index=2&list=PLPvqVA0h0J6h_KZG_XW0cYwcTZJU22Vkb		
11	https://www.youtube.com/playlist?list=PLPvqVA0h0J6hMD30iKtGqjg1QYikZxJGV		