

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Diploma Engineering				Branch		Automobile	
Semester		III				Version		1.0.0.0	
Effective from Academic Year			2019-20			Effective for the batch Admitted in			June 2018
Subject code		1AU2301		Subject Name		AUTOMOBILE ENGINE			
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:
<ul style="list-style-type: none"> • Basic Fundamentals of S.I. & C.I. Engine. • To understand the working & construction of different types of I.C. engine components. • Maintain petrol and diesel automotive engines

Course Content						
Name of UNIT	Unit Content		Unit Learning Outcomes		Marks	Hrs
Unit – I Introduction to I.C. Engine.	1 a	Automobile Vehicles-history, arrangement & different systems.	1.1	Describe automotive systems.	12	09
	1 b	Types of Engines.	1.2	Describe Engines Types.		
	1 c	Principles of I.C. engines for automobiles	1.3	Differentiate Petrol v/s Diesel Engine.		
	1 d	Mechanism of piston type engine and related terms	1.4	Explain Otto and Diesel Cycle.		
	1 e	Two and four stroke Otto cycle, Two stroke and four stroke diesel cycle	1.5	Compare single & Multi-cylinder engines.		
	1 f	Merits and demerits of single and multi cylinder engines.				
Unit – II Constructional and functional details of	2 a	Construction of I.C. Engines-Major, minor components, sub-assemblies, systems, etc.	2.1	Describe construction & working of different components, systems, subassemblies, of IC Engines.	12	11
	2 b	Functions of I.C. Engine-Major, minor components, subassemblies.	2.2	Differentiate		

components of I.C. Engines	2 c	Engine ignition timing, firing order balancing.	2.3	components of petrol and diesel engine. Explain Engine ignition timing, firing order balancing		
Unit– III Types of combustion chamber	3 a	Different types of combustion chamber used in S.I. engine with their relative advantages	3.1	Identify constructional difference between combustion chambers of S. I. Engines.	06	04
	3 b	Different types of combustion chamber Used in C.I. engine with their relative advantages	3.2	Identify constructional difference between combustion chambers Of C.I. Engines		
Unit– IV Fuel systems for Petrol & diesel engine	4 a	Fuel flow diagram for Petrol& Diesel engines-Description & advantages.	4.1	Describe petrol fuel systems with advantages of each System.	12	09
	4 b	Construction and function of simple Carburettor.	4.2	Explain construction & working of fuel Carburation system.		
	4 c	Types and Working of air cleaner	4.3	Explain construction & working of fuel Injection systems.		
	4 d	Gasoline Fuel Injection System.	4.4	Explain working of various modern fuel injection systems for Petrol engine.		
	4 e	Classification of Fuel Injection System. Throttle, Body Injection (TBI) System. Port Fuel Injection (PFI) System, MPFI system	4.5	Describe various diesel fuel injection systems.		
	4 f	Construction and working of Different diesel fuel injection system.	4.6	Explain construction and working of various fuel systems.		
	4g	Construction & Functions of Common Rail Direct Injection (CRDI)	4.7	Explain working of various modern fuel injection systems for diesel engine		
	4f	Details of different types of injectors.	4.8	Describe construction & working of Common Rail Direct Injection		
	4g	Various types of governors.				
	4h	Types of diesel filters.				
	4i	Working of fuel feed pump for diesel engine.				
4j	Diesel electronic control system (DECS)					
Unit– V Cooling system of I. C. Engines	5 a	Necessity of cooling system in I.C. engines.	5.1	Explain need of Cooling system.	06	04
	5 b	Types of cooling system.	5.2	Explain construction & working of various cooling Systems.		
	5 c	Construction & working of cooling system.				

	5 d	Types & Characteristics of a Coolant , and their effect on performance of cooling and engine	5.3	Describe attributes & effects of coolants.		
Unit– VI Lubricating System of I.C. engines	6 a	Necessity of lubricating system in Engine	6.1	Elements & working of lubricating system.	06	04
	6 b	Properties of engine oils, & effect on performance of lubricating of engines	6.2	Explain elements & working of lubricating Systems.		
	6 c	Types of a lubricating system,	6.3	Describe properties of engine oils and their effects		
	6 d	Elements & working of lubricating system.				
Unit– VII Super charging of I.C. engine	7 a	The purpose of super charging,	7.1	Explain purpose of supercharger with its Merits and demerits.	06	04
	7 b	Merits & limitations of super charger,	7.2	Describe various types of superchargers		
	7 c	Types & construction of super charger,	7.3	Explain construction & working of superchargers,		
	7 d	Principle & Construction of Turbocharger, Intercoolers.		Turbocharger, Intercoolers.		

List of Practical (Any seven)		
No.	Unit	Name of Practical
1	I	Demonstrate working of two & four stroke S.I. engines.
2	I	Demonstrate working of two & four stroke C.I. engines
3	II	Demonstrate constructional details of piston, connecting rod & crank shaft.
4	II	Demonstrate construction & working of valve gear mechanism (Camshaft, Timing gear).
5	IV	Demonstrate construction of Gasoline Fuel Injection System & Multi point fuel injection system.
6	IV	Observe construction & operation of fuel injector, its nozzle & fuel filters.
7	IV	Demonstrate construction & working of Common Rail direct injection system.
8	V	Demonstrate construction & function of cooling system and its components.
9	VI	Observe construction & function of various lubricating system & its components.
10	VII	Observe construction & working of Turbocharger and Supercharger.
List of Instruments/Equipment/Trainer Board		
1	Models of various components of I.C. Engine. <ul style="list-style-type: none"> ➤ Cut Section model showing Two Stroke Petrol/ Diesel Engine. ➤ Cut Section model showing Four Stroke Petrol/ Diesel Engine. ➤ Cut Section model showing Fuel Systems (Circuits) for various fuels. ➤ Cut Section model showing Lubricating System. ➤ Cut Section model showing cooling System 	
2	Charts for Otto & Diesel Cycles, Components of I.C Engines, Fuel Systems (Circuits) of Petrol/ Diesel/ LPG/ CNG powered Engines, Lubricating System and Cooling Systems.	
3	Charts for MPFI & CRDI System.	

List of Text Books			
No	Title of Reference Books	Authors	Publication
1	Automobile Engineering	R. B. Gupta	Satya Prakashan, New Delhi
2	Automobile Engineering: In a nutshell (Part-I)	Kirpal Singh	Standard Publishers Distributors
List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Automobile Engineering Vol-I	Anil Chhikara	Satya Prakashan, New Delhi
2	Automobile Engineering	K. M. Gupta	Umesh Publication
3	A Textbook Of Internal Combustion Engines	R. K. Rajput	Laxmi Publication Ltd.
4	Automotive Mechanics	W.H.Crouse & D.L. Anglin	Tata Mc-Graw Hill Publishing Co. Ltd
5	Internal Combustion Engine	V.M. Domkunwar	Dhanpat Rai & Co

Link of Learning Web Resource	
1	http://auto.indiamart.com/auto-technology/auto-tech-engine.html
2	http://inventors.about.com/library/weekly/aacarsgasa.htm
3	http://www.engineering.com/Videos/VideoPlayer/tabid/4627/Videoid/573/Internal-Combustion-Engine.aspx
4	https://www.objectivebooks.com/2015/06/ic-engine-online-test.html

CO'S AND PO'S MAPPING

PO'S		CO1	CO2	CO3
PO1	An ability to apply knowledge of mathematics and engineering science.	SLI	SLI	MED
PO2	An ability to demonstrate, develop and conduct experiments, as well as to analyze and interpret data.	SUB	SUB	SUB
PO3	An ability to design a system component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.	NONE	SLI	SUB
PO4	An ability to perform with multidisciplinary teams.	MED	SLI	MED
PO5	Use of appropriate modern tool and application software that pertain to Automobile engineering technology systems.	SUB	MED	SUB
PO6	An ability to identify, formulates, execute and solve engineering problems.	SLI.	SUB	MED.
PO7	An ability to communicate and present effectively in both verbal and written forms.	SLI	MED.	SUB
PO8	The broad education necessary to understand the impact of engineering solutions in global, economic, environmental and societal context.	MED.	SUB.	SUB.
PO9	Recognition of need for self-improvement, and an ability to engage in life-long learning.	SLI	NONE	NONE
PO10	Ability to aware about the contemporary issues.	SLI	SLI	SLI
PO11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	MED.	SUB.	MED.
PO12	Demonstrate to analyse and apply unconventional processes, automation, robotics Nanotechnology, Computer-Aided-Design & Manufacturing and knowledge in Automobile Engineering, Thermodynamics, Refrigeration & Air Conditioning and Jet Propulsion & Rocket Engineering to analyse and solve complex problems and to work professionally in such systems and plants.	SLI	MED.	MED.