

GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology				Branch/Spec.	Automobile Engineering			
Semester	VIII				Version	1.0.0.0			
Effective from Academic Year			2020-21		Effective for the batch Admitted in			July 2017	
Subject code	2AE804PE2		Subject Name		Automotive Combustion and Engine Technology				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	3	0	0	0	3	Theory	40	60	100
Hours	3	0	0	0	3	Practical	0	0	0
Pre-requisites:									
Fundamentals of Automobile Engines									
Objectives of the Course:									
After completion of this course, student will be able to									
<ol style="list-style-type: none"> 1. Describe basic concepts of combustion process in diesel engine 2. Describe basic concepts of combustion process in spark ignition engine. 3. Describe basic concepts of combustion process in HCCI engine. 4. Describe basic concepts of combustion process in GDI engine. 5. Describe and analysis effect of super charging in petrol engine. 6. Describe and analysis effect of stratification in engine. 									
Theory syllabus									
Unit	Content								Hrs.
1	Overview of gasoline direct injection engines: Engine Introduction, overview of direct injection gasoline engines, potential and technologies for high efficiency direct injection gasoline engine, high pressure fuel injection system, exhaust emissions and after treatment devices								9
2	Stratified charge combustion in direct injection gasoline engines: Introduction, thermodynamics and combustion process, production engines with stratified gasoline direct injection								9
3	Turbocharged direct injection spark ignition engine: Ideal Introduction, historical background: turbocharging for high specific output, problems and challenges associated with turbocharging spark ignition engines, advantages of combining direct injection and turbocharging in spark ignition engines, challenges of applying direct injection to a turbocharged spark ignition engine								9
4	Direct injection gasoline engines with auto ignition combustion: Flow Introduction, principle of auto ignition combustion in the gasoline engines, approaches to auto ignition combustion operation in gasoline engines, operation and control of direct injection gasoline engines with auto ignition combustion.								9
5	Homogenous Charge Compression Ignition (HCCI) Engines: Introduction, HCCI combustion fundamentals, Gasoline HCCI engine, Diesel HCCI combustion engines, operational limits and emissions.								9
Practical content									
None									
Text Books.									
1	Internal Combustion Engine Fundamentals by John B. Heywood, McGraw Hill Education Pvt Ltd.								
2	Internal Combustion Engine by V Ganeshan, McGraw Hill Education Pvt Ltd.								
Reference Books									
1	Advanced Direct Injection Combustion Engine Technologies and Development. Vol.1								
2	Gasoline and gas engines by Hua Zhao								

ICT/ MOOCs references	
1.	NIL
Course Outcomes:	
<ol style="list-style-type: none">1. Understand GDi and fuel systems of IC Engine.2. Understand stratified combustion and its process.3. Do the need of turbocharge in SI and CI engine.4. Overview of HCCI technology and its functions.	