III Year: Sixth Semester

CODE: AE302 **Title:** I C Engines										
L	**T**	**P**	Credit	Area		**CWS**	**PRS**	**MTE**	**ETE**	**PRE**
3	0	2	4	DCC		15	25	20	40	-

Objectives: To understand the basic principle and IC Engine. To know about different components in IC Engine, power generation in IC Engine. To analyze the combustion process in SI and CI engine. To understand and evaluate the auxiliary system in IC engine.

Syllabus		**Contact Hours**
Unit-1	**Introduction to I.C Engines**: Principle of working, Classification; Air std. Fuel air and actual cycles, two and four stroke, SI and CI engines main parts, valve and port timing diagram	**7**
Unit-2	**Combustion Phenomenon in SI engines:** Principles of combustion in SI engine, effect of engines and operating variables on ignition delay & flame propagation, combustion chamber for SI engines, cycle to cycle variation, pre-ignition, abnormal combustion, theories of detonation, effect of engine and operating variables on detonation, surface ignition, adiabatic flame temperature, ignition systems	**7**
Unit-3	**Combustion phenomenon in CI engines:** Principles of combustion in CI engine, delay period, variables affecting delay period, diesel knock, methods of controlling diesel knock, combustion process & combustion chambers for CI engines	**7**
Unit-4	**Fuel system and Mixture requirement in SI and CI Engine:** Carburetion- working principles, chemically correct air-fuel ratio and load variation, compensating devices, venture and jet dimension calculation, modern fuel induction system, multi point fuel injection system, fuel injection: common rail direct injection	**7**
Unit-5	**Engine Testing, Supercharging, Lubrication and Engine Cooling:** Engine performance and testing, measurement of power, supercharging limits of SI &CI engines methods of supercharging, superchargers, turbo charging, lubrication principles, function of lubricating system, properties of lubricating oil, additives, cooling system, air cooling, water cooling	**8**
Unit-6	**Introduction to Automotive Fuels:** Petroleum based fuels and their properties, necessity of alternative fuels, LPG, CNG, producer gas, biogas, H2, biodiesel and alcohols, knock rating of engine fuels	**6**
	Total	**42**

Reference Books:	
1	Funguson, I.C Engines ISBN-13: 978-0471356172
2	2 Fundamentals of I.C Engines by HN Gupta. ISBN-13: 978-81-203-4680-2
3	3 Mathew & Sharma, I.C Engines by, Khanna Pub.ISBN, 9383182428.
4	4 Ganeson, IC Engines TMH, ISBN: 9781259006197
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Course Outcomes

CO1	To understand basics of IC engines, engine types and their components.
CO2	To understand the power generation phenomenon in ci engines
CO3	To understand the power generation phenomenon in SI engines
CO4	To compare the CI and SI engine indifferent terms like fuels, their rmixtures , To know about CRDI engine
CO5	To analyse the engine performance by testing engine with different additional system like TC , SUPERCHARGER
CO6	To study about different alternate automotive fuels

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2