

**B.E Semester: 8 Automobile Engineering**  
**Subject Name: Combustion Technology (AE804-N-D)**  
**[Dept. Elect.-6]**

**A. Course Objective:**

- To present a problem oriented in depth knowledge of Combustion Phenomena of Engine.
- To address the underlying concepts and methods behind Actual Combustion Process of Engine.

**B. Teaching / Examination Scheme:**

Teaching Scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
3	0	0	3	3	3	70	30	20	00	120

**C. Detailed Syllabus:**

Unit No.	Details
1	<b>Overview of gasoline direct injection engines</b> 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
2	<b>Stratified charge combustion in direct injection gasoline engines</b> Introduction, thermodynamics and combustion process, production engines with stratified gasoline direct injection
3	<b>Turbocharged direct injection spark ignition engine</b> 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
4	<b>Direct injection gasoline engines with auto ignition combustion</b> 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.
5	<b>Homogenous Charge Compression Ignition (HCCI) Engines</b> Introduction, HCCI combustion fundamentals, Gasoline HCCI engine, Diesel HCCI combustion engines, operational limits and emissions.

<b>Total hours (Theory):48</b>
<b>Total hours (Practical):00</b>
<b>Total hours:48</b>

#### D. Lesson Planning:

Sr. No.	Date/Week	Unit	Weight age	Topic No
1	1 <sup>st</sup> ,2 <sup>nd</sup> ,3 <sup>rd</sup>	Unit 1	20%	1
2	4 <sup>th</sup> ,5 <sup>th</sup> ,6 <sup>th</sup>	Unit 2	20%	2
3	7 <sup>th</sup> , 8 <sup>th</sup> ,9 <sup>th</sup>	Unit 3	20%	3
4	10 <sup>th</sup> . 11 <sup>th</sup> . 12 <sup>th</sup>	Unit 4	20%	4
5	13 <sup>th</sup> , 14 <sup>th</sup> ,15 <sup>th</sup> ,16 <sup>th</sup>	Unit 5	20%	5

#### E. Instructional Method & Pedagogy

1	At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2	Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal Weight age should be given to all topics while teaching and conduction of all examinations.
3	Attendance is compulsory in lectures, which may carries five marks in overall evaluation.
4	One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
5	Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6	Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.

#### F. Students Learning Outcomes:

1	The student can take the basic combustion process of Petrol and Diesel Engine.
2	The students can identify how to improve Performance of the Engine.

#### G. Text Books & Reference Books:

1	Internal combustion engine by v ganesan
2	Internal combustion engine by heywood
3	HCCI and CAI engines for the automotive industry by Hua Zhao
4	Gasoline and gas engines by Hua Zhao
5	Advanced Direct Injection Combustion Engine Technologies and Development. Vol.1
6	Internal combustion engine by Mathur & Sharma
7	Internal combustion engine by Domkundwar