

## Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research  
 Name of the Faculty member : SATBIR SINGH  
 Discipline : Mechanical Engineering  
 Semester : 6<sup>th</sup>  
 Subject : I.C. ENGINE  
 Lesson Plan Duration : 15 weeks (from FEB 2021 to MAY 2021)  
 Work Load : L: 4 T: 0 P: 0

1 <sup>st</sup>	1	Internal and external combustion engines
	2	Classification of I.C. Engines
	3	Cycle of operations in four strokes and two-stroke IC engines
	4	Assumptions made in air standard cycles; Otto cycle
2 <sup>nd</sup>	5	Diesel cycle
	6	Dual combustion cycle
	7	Numerical problems
	8	Comparison of Otto, diesel and dual combustion cycles
3 <sup>rd</sup>	9	Sterling and Ericsson cycles
	10	Air standard efficiency, Specific work output Specific weight; Work ratio;
	11	Mean effective pressure, Deviation of actual engine cycle from ideal cycle.
	12	<b>CLASS TEST</b>
4 <sup>th</sup>	13	Mixture requirements for various operating conditions in S.I. Engines; Elementary carburetor
	14	Calculation of fuel air ratio; The complete carburetor
	15	Requirements of a diesel injection system; Type of injection system
	16	Petrol injection; Requirements of ignition system
5 <sup>th</sup>	17	Types of ignition systems, ignition timing; Spark plugs.
	18	S.I. engines; Ignition limits; Stages of combustion in S. I. Engines; Ignition lag;
	19	Velocity of flame propagation, Detonation; Effects of engine variables on detonation
	20	<b>Sessional Test-1</b>
6 <sup>th</sup>	21	Theories of detonation; Octane rating of fuels; Pre-ignition
	22	S.I. engine combustion chambers
	23	Stages of combustion in C.I. Engines
	24	Delay period; Variables affecting delay period
7 <sup>th</sup>	25	Knock in C.I. Engines; Cetane rating; C.I. Engine combustion chambers.
	26	Functions of a lubricating system
	27	Types of lubrication system
	28	<b>CLASS TEST</b>
8 <sup>th</sup>	29	Mist, Wet sump and dry sump systems; Properties of lubricating oil
	30	SAE rating of lubricants; Engine performance and lubrication
	31	Necessity of engine cooling; Disadvantages of overcooling
	32	Cooling systems; Air-cooling, Water-cooling; Radiators.
9 <sup>th</sup>	33	Performance parameters; BHP, IHP, Mechanical efficiency
	34	Brake mean effective pressure and indicative mean effective pressure
	35	Torque, Volumetric efficiency; Specific fuel consumption (BSFC, ISFC)
	36	Thermal efficiency; Heat balance
10 <sup>th</sup>	37	Basic engine measurements; Fuel and air consumption

	38	Brake power, Indicated power and friction power,
	39	Heat lost to coolant and exhaust gases
	40	<b>Sessional Test-2</b>
11 <sup>th</sup>	42	Performance curves
	42	Pollutants from S.I. and C.I. Engines
	43	Methods of emission control, Alternative fuels for I.C. Engines;
	44	The current scenario on the pollution front.
12 <sup>th</sup>	45	Working of a single stage reciprocating air compressor
	46	Calculation of work input; Volumetric efficiency; Isothermal efficiency
	47	Advantages of multi stage compression
	48	Two stage compressor with inter-cooling
13 <sup>th</sup>	49	Perfect inter cooling
	50	Optimum intercooler pressure
	51	<b>CLASS TEST</b>
	52	Isentropic efficiency.
14 <sup>th</sup>	53	Rotary air compressors and their applications;
	54	Brayton cycle; Components of a gas turbine plant
	55	Open and closed types of gas turbine plants; Optimum pressure ratio
	56	Improvements of the basic gas turbine cycle
15 <sup>th</sup>	57	Multi stage compression with inter-cooling
	58	Multi stage expansion with reheating between stages
	59	Exhaust gas heat exchanger; Application of gas turbines.
	60	<b>Sessional Test-3</b>

(Signature of the teacher concerned with date)