

<u>Lesson Plan</u>			
		Name of Faculty	: Pratik Vashist
		Discipline	: Automobile
		Semester	: 4th
		Subject	: BTHP
		Lesson Plan Duration :	15 Weeks
Week	Theory		Practical Day
	Lecture Day	Topic	
1st	1st	<b>Thermodynamics Unit 1-</b> Introduction, Energy, work and heat Thermodynamic state and system, boundary,	1st
	2nd	Types of thermodynamic systems: closed, open, isolated, adiabatic	
	3rd	Thermodynamic properties: pressure, volume, temperature, enthalpy, internal energy, entropy	
	4th	Revision and numerical problems	
2nd	5th	<b>Unit 2-</b> Gas Laws: Definition of gas, Boyle's law, Charle's law, Joule's law, Avagadro's law	2nd
	6th	Ideal and real gas, Characteristics equation, gas constant,	
	7th	Specific heat at constant pressure, specific heat at constant volume of gas	
	8th	Revision and numerical problems	
3rd	9th	Regnault's law, universal gas constant, Vander-Wall's equation	3rd
	10th	<b>Unit 3-</b> Laws of Thermodynamic:- Zeroth, first and second law of thermodynamics (concept only)	
	11th	Applications of first law of thermodynamics, Steady flow energy equation	
	12th	Revision and numerical problems	
4th	13th	constant volume, constant pressure, isothermal, hyperbolic, adiabatic, polytropic, throttling process	4th
	14th	free expansion processes; P-V & T-S diagrams, Air Standard Cycles (without derivation)	
	15th	<b>Unit 4-</b> Definition of heat engine cycle, net work done in a cycle	
	16th	Revision and numerical problems	
5th	17th	air standard efficiency of cycle, Description of Carnot cycle, Otto cycle	5th
	18th	Diesel cycle and Dual combustion cycle	

5th	19th	<b>B. Hydraulics: Unit 5-</b> Introduction, Fluids and non-fluids, Liquid, gas and vapour	
	20th	Revision and numerical problems	
6th	21st	Properties of fluids: Mass density, specific weight, pressure, specific volume, specific gravity, viscosity	6th
	22nd	compressibility, vapour pressure, surface tension, capillarity	
	23rd	<b>Unit 6-</b> Fluid statics: Concept of pressure, static pressure and pressure head,	
	24th	Revision and numerical problems	
7th	25th	Types of pressure: Atmospheric pressure, gauge pressure	7th
	26th	vacuum, absolute pressure, Measurement of pressure: Single tube manometer, U - tube manometer	
	27th	Differential manometer, bourdon gauge, Pascal's law and its applications	
	28th	Revision and numerical problems	
8th	29th	<b>Unit 7-</b> Flow of Fluids: Types of fluid flow: steady and unsteady, uniform and non - uniform	8th
	30th	laminar and turbulent, Rate of flow and its units	
	31st	Continuity equation of flow	
	32nd	Revision and numerical problems	
9th	33rd	Bernoulli's theorem (without proof) and its applications	9th
	34th	Simple problems	
	35th	<b>Unit 8-</b> Hydraulic Devices: Principle of working	
	36th	Revision and numerical problems	
10th	37th	Layout of hydraulic system, Various components of hydraulic system	10th
	38th	function of each component	
	39th	Revision	
	40th	Revision and numerical problems	
11th	41st	Types of hydraulic pumps- reciprocating pump, centrifugal pump	11th
	42nd	gear type pump, screw pump	

	43rd	vane type pump and their working	
	44th	Revision and numerical problems	
12th	45th	Description, operation and application of hydraulic machines – hydraulic ram	12th
	46th	hydraulic jack, hydraulic brake	
	47th	hydraulic accumulator, hydraulic press.	
	48th	Revision and numerical problems	
13th	49th	<b>PNEUMATICS: Unit 9-</b> Basic concept of pneumatics	13th
	50th	Layout of pneumatic system	
	51st	Various components of pneumatic system and their functions	
	52nd	Revision and numerical problems	
14th	53rd	Construction and working of reciprocating and rotary air compressor	14th
	54th	Comparison of hydraulic system and pneumatic system.	
	55th	<b>Unit 10-</b> Pneumatic tools: Construction and working of pneumatic gun	
	56th	Revision and numerical problems	
	57th	Uses of pneumatic gun for pneumatic screw driver	15th
	58th	pneumatic wrenches and pneumatic nut runner	
	59th	Revision	
	60th	Revision and numerical problems	

Practical
Topic
1. Measurement of temperature by thermocouple, pyrometer and infrared thermometer
2. Measurement of pressure head by piezometer tube and manometer.
3. Verification of Bernoulli's theorem.
4. To study the hydraulic circuit of an automobile brake and hydraulic ram.
5. Use of hydraulic press in removal and fitting of bearing, bushes and cylinder liner.

6. Dismantling and assembling of gear pump.

7. Study of reciprocating air compressor.

viva

8. Inflating and deflating of tyres, checking of air pressure in tyres.

9. Study of a pneumatic circuit.

10. Practice on pneumatic tools like pneumatic screw driver & pneumatic wrench
