

## Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research  
 Name of the Faculty member : SATBIR SINGH  
 Discipline : Mechanical Engineering  
 Semester : 8<sup>th</sup>  
 Subject : Automobile Engineering  
 Lesson Plan Duration : 15 weeks (from January 2020 to April 2020)  
 Work Load : L: 4 T: 0 P: 0

1 <sup>st</sup>	1	Brief history of automobiles, Main components of an automobile
	2	Brief description of each component. Constructional details and working of a four stroke I.C. Engine
	3	Multi-cylinder engines, Introduction to recent developments in I.C. Engines
	4	Direct injection systems, Multi-point fuel injection systems, Introduction,
2 <sup>nd</sup>	5	Brief description of different components of Transmission System.
	6	Introduction to Clutch and its different types,
	7	Principle of Friction Clutch, Clutch Lining
	8	Friction materials used in Friction Clutches
3 <sup>rd</sup>	9	Torque transmitted, Brief description of Cone Clutch
	10	Single Plate and Multi plate Clutches
	11	Dry and wet clutches
	12	<b>CLASS TEST</b>
4 <sup>th</sup>	13	Automatic clutch action, Centrifugal clutches
	14	Electromagnetic clutches, Fluid Flywheel
	15	Gear Box Air resistance, gradient resistance
	16	Rolling resistance coming across a moving automobile
5 <sup>th</sup>	17	Tractive effort, Variation of tractive effort with speed
	18	Performance curves (object and need of a gear box)
	19	Sliding mesh gear box, Control mechanism
	20	<b>Sessional Test-1</b>
6 <sup>th</sup>	21	Sliding type selector mechanism, Ball type selector mechanism
	22	Steering column gear shift control, Constant mesh gear box
	23	Synchromesh device, Automatic transmission in general
	24	AP automatic gear box, Torque converter
7 <sup>th</sup>	25	Torque converter with direct drive
	26	Lubrication of Gear Box.
	27	Functions and requirements of a propeller shaft
	28	<b>CLASS TEST</b>
8 <sup>th</sup>	29	Universal joints, Constructional forms of universal joints
	30	Flexible-ring joints, Rubber-bushed flexible joints
	31	Constant-velocity joints. Differential : Principle of operation
	32	Constructional details of a typical Differential unit
9 <sup>th</sup>	33	Traction control differentials, Multi-plate clutch type traction control device
	34	Functions and methods of operation of Brake
	35	Brake efficiency. Elementary theory of shoe brake, brake shoe adjustments
	36	A modern rear-wheel brake, Disc brakes, Brake linkages
10 <sup>th</sup>	37	Leverage and adjustment of the brake linkage

	38	Servo- and power operated brakes, Vacuum brake operation
	39	Hydraulic Brakes-constructional details and working
	40	<b>Sessional Test-2</b>
11 <sup>th</sup>	42	Direct action vacuum servos, Power-operated brakes
	42	A dual power air brake system, Suspension system: Suspension principles
	43	Road irregularities and human susceptibility, Suspension system,
	44	Damping, Double tube damper, Single tube damper, Lever arm type damper
12 <sup>th</sup>	45	Springs-Leaf springs, Coil and torsion springs, variable rate springs
	46	Composite leaf springs, Rubber springs, Air springs
	47	Adjustable and self-adjusting suspensions, Interconnected suspension system
	48	Interconnected air and liquid suspensions, Independent suspension system
13 <sup>th</sup>	49	Different independent suspension layouts, McPherson strut type
	50	Rear suspension-live axle, McPherson strut rear suspension.
	51	<b>CLASS TEST</b>
	52	Castor, Camber, Kingpin inclination, Combined angle, Toe-in, Steering system-basic aims, Ackerman linkage
14 <sup>th</sup>	53	Steering linkages for independent suspension, Center point steering, Costarring or trailing action
	54	Cornering power, Self-righting torque, Steering characteristics-over steer and under steer
	55	Axle beam, Stub-axle construction, Steering column, Reversible and irreversible steering, Rack-and-pinion steering mechanism
	56	Effect of toe-in on steering, Power steering, Vickers System
15 <sup>th</sup>	57	Recent trends in automobile engineering Multi fuel automobiles, Automobiles running on alternate sources of energy
	58	Emission control through catalytic converter
	59	Double catalytic converter, Aspects of pollution control in Automobiles.
	60	<b>Sessional Test-3</b>

(Signature of the teacher concerned with date)