

## Lesson Plan

Name of Faculty : Ms. SUSHMA

Discipline : Automobile Engg.

Semester : 4<sup>th</sup>

Subject : AUTO ENGINE-1

Lesson Plan Duration : 15 weeks ( From January ,2018 to April,2018)

Work Load (Lecture /Practical) per week in hours : Lecture 4 Practical -2

Week	Theory		Practical	
	Lecture Day	Topic ( Including assignment/test )	Practical Day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	<b>INTRODUCTION;-</b> Engine as a power source - Concept of internal combustion engine. -	1	Servicing of lubricating system
	2 <sup>nd</sup>	- Engine dimensions: Bore, stroke, dead centres, compression ratio, swept volume,		
	3 <sup>rd</sup>	clearance volume, engine capacity, engine torque engine		
	4 <sup>th</sup>	Power at the crank shaft.		
2 <sup>nd</sup>	1 <sup>st</sup>	Classification of engines as per stroke, cycle,	2	Servicing of fuel systems in petrol engines
	2 <sup>nd</sup>	Fuel ignition.		
	3 <sup>rd</sup>	Cooling number system.		
	4 <sup>th</sup>	Arrangement of cylinders.		
3 <sup>rd</sup>	1 <sup>st</sup>	Reciprocating and rotary cylinder	3	Servicing of fuel injector
	2 <sup>nd</sup>	Concept of 2 stroke and 4 stroke engines and their comparison.		
	3 <sup>rd</sup>	Working principles of petrol and diesel engines.		
	4 <sup>th</sup>	Constructional details of engine		
4 <sup>th</sup>	1 <sup>st</sup>	Itroduction of different parts of engine		
	2 <sup>nd</sup>	Material used for different parts		

	3 <sup>rd</sup>	cylinder block, cylinder head		
	4 <sup>th</sup>	Cylinder liner piston, piston rings		
5 <sup>th</sup>	1 <sup>st</sup>	Gudgeon pin, connecting rod	4	Servicing of F.I.P (Fuel Injection Pump)
	2 <sup>nd</sup>	Crankshaft and camshaft		
	3 <sup>rd</sup>	Valve mechanisms		
	4 <sup>th</sup>	Flywheel and damper.		
6 <sup>th</sup>	1 <sup>st</sup>	FUEL SYSTEM Fuel system in spark ignition engine	5	Engine tune up
	2 <sup>nd</sup>	Fuel feed system		
	3 <sup>rd</sup>	Fuel pumps-its types		
	4 <sup>th</sup>	Fuel tank, fuel lines, fuel filters		
7 <sup>th</sup>	1 <sup>st</sup>	Concept of carburetion	6	Study of turbocharger
	2 <sup>nd</sup>	Working and construction of a simple carburetor		
	3 <sup>rd</sup>	Advantages of using fuel injection system in spark ignition engines.		
	4 <sup>th</sup>	Concept of MPFI system, Constructional details of an MPFI system.		
8 <sup>th</sup>	1 <sup>st</sup>	Dry and wet air cleaners	7	Servicing of cooling system
	2 <sup>nd</sup>	Concept of VVT technology.		
	3 <sup>rd</sup>	Ignition System in S.I. Engine		
	4 <sup>th</sup>	Concept of ignition system		

Week	Theory		Practical	
	Lecture Day	Topic ( Including assignment/test )	Practical Day	Topic
9th	1 <sup>st</sup>	Battery ignition system.	8	Study of engine block
	2 <sup>nd</sup>	Magneto type of ignition system		
	3 <sup>rd</sup>	Electronic ignition system		
	4 <sup>th</sup>	Function of, ignition coil condenser,		
10th	1 <sup>st</sup>	Contact breaker point,	9	Servicing of fuel system in diesel engine
	2 <sup>nd</sup>	Distributors, spark plugs.		
	3 <sup>rd</sup>	Distribution less ignition system.		

	4 <sup>th</sup>	Cooling System		
11 <sup>th</sup>	1 <sup>st</sup>	Necessity of cooling system	10	Study of M.P.F.I engine
	2 <sup>nd</sup>	Air cooling, Water cooling system		
	3 <sup>rd</sup>	Radiators, thermostat, water pump, fan		
	4 <sup>th</sup>	pressure cap, water jacket		
12 <sup>th</sup>	1 <sup>st</sup>	Antifreeze solution		File checking
	2 <sup>nd</sup>	Trouble shooting.		
	3 <sup>rd</sup>	Lubrication System Necessity of lubrication system,		
	4 <sup>th</sup>	pressure lubrication system..		
13 <sup>th</sup>	1 <sup>st</sup>	Splash lubrication		Practice
	2 <sup>nd</sup>	Components of lubrication system		
	3 <sup>rd</sup>	Service ratings of lubricating oil.		
	4 <sup>th</sup>	Oil coolers, classification		
14 <sup>th</sup>	1 <sup>st</sup>	Oil pump, oil lines, oil filters		Practice
	2 <sup>nd</sup>	Additives for lubricants		
	3 <sup>rd</sup>	Revision		
	4 <sup>th</sup>	Revision		
15 <sup>th</sup>	1 <sup>st</sup>	Revision		Practice
	2 <sup>nd</sup>	Revision		
	3 <sup>rd</sup>	Revision		
	4 <sup>th</sup>	Revision		

(Signature of the teacher concerned with date)

## Lesson Plan

Name of Faculty : Yet To be Assigned  
 Discipline : Automobile Engg.  
 Semester : 4<sup>th</sup>  
 Subject : CBT-I  
 Lesson Plan Duration : 15 weeks ( From January ,2018 to April,2018)

Work Load (Lecture /Practical) per week in hours : Lecture 4 Practical -4

Week	Theory		Practical	
	Lecture Day	Topic ( Including assignment/test )	Practical Day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	<b>1. <u>Chassis and Body</u></b> Classification of vehicles, types of chassis.		1. Study and sketches of Heavy and Light vehicle chassis.
	2 <sup>nd</sup>	layout of conventional type of chassis, function and arrangement of major assemblies.		
	3 <sup>rd</sup>	Alternating arrangement used such as engine position,		
	4 <sup>th</sup>	drive types, their merits and demerits.		
2 <sup>nd</sup>	1 <sup>st</sup>	types of frame and body streamlining		2. Identify and servicing of single plate and multi plate clutch.
	2 <sup>nd</sup>	cross members, brackets		
	3 <sup>rd</sup>	materials of frame and body upholstery.		
	4 <sup>th</sup>	Revision, Assignment		
3 <sup>rd</sup>	1 <sup>st</sup>	<b>2. <u>Clutch</u></b> Necessity.		3. Study and sketch of centrifugal clutch.
	2 <sup>nd</sup>	function and requirements of clutch		
	3 <sup>rd</sup>	types of clutch - single plate clutch.		
	4 <sup>th</sup>	multi plate clutch		
4 <sup>th</sup>	1 <sup>st</sup>	hydraulic power assisted and wet and dry plate clutch		4. Servicing and overhauling of constant mesh and synchromesh gear box
	2 <sup>nd</sup>	clutch plate and lining material		

	3 <sup>rd</sup>	Constructional details of centrifugal clutch.		
	4 <sup>th</sup>	working of centrifugal		
5 <sup>th</sup>	1 <sup>st</sup>	semi centrifugal clutch		5. Servicing of universal joints, slip joint and propeller shaft
	2 <sup>nd</sup>	fluid coupling.		
	3 <sup>rd</sup>	<b>3. Transmission</b> Necessity Of manual Transmission. function and types of manual transmission.		
	4 <sup>th</sup>	Sliding Mesh		
6 <sup>th</sup>	1 <sup>st</sup>	constant mesh		6. Servicing of differential, adjustment of crown and pinion backlash.
	2 <sup>nd</sup>	synchromesh		
	3 <sup>rd</sup>	. Over drive		
	4 <sup>th</sup>	over running clutch		
7 <sup>th</sup>	1 <sup>st</sup>	description and operation of transfer gearbox.		7. Checking and adjustment of steering geometry, camber, caster, Toe-in, Toe-out, kingpin inclination.
	2 <sup>nd</sup>	Common faults and remedies		
	3 <sup>rd</sup>	Types of automatic transmission and their main components		
	4 <sup>th</sup>	Epicyclic gear box – construction		
8 <sup>th</sup>	1 <sup>st</sup>	working and determination of speed ratio.		8. Study of live axles.
	2 <sup>nd</sup>	Torque converter		
	3 <sup>rd</sup>	construction, principle of working.		
	4 <sup>th</sup>	Continuously transmission		

Week	Theory		Practical	
	Lecture Day	Topic ( Including assignment/test )	Practical Day	Topic
9th	1 <sup>st</sup>	Automated Manual Transmission		
	2 <sup>nd</sup>	<b>4. Final Drive.</b> Propeller shaft .		
	3 <sup>rd</sup>	function, construction details.		
	4 <sup>th</sup>	Universal joints - functions and types.		
10th	1 <sup>st</sup>	Types of final drive		

	2 <sup>nd</sup>	hotchkiss drive		
	3 <sup>rd</sup>	torque tube drive		
	4 <sup>th</sup>	Differential – principle		
11 <sup>th</sup>	1 <sup>st</sup>	functions and its working.		
	2 <sup>nd</sup>	Rear axles.		
	3 <sup>rd</sup>	<b>5. Front Axle</b> Types		
	4 <sup>th</sup>	Stub double drop		
12 <sup>th</sup>	1 <sup>st</sup>	fully dropped, load distribution		
	2 <sup>nd</sup>	effect of braking on axle shape.		
	3 <sup>rd</sup>	steering head		
	4 <sup>th</sup>	Elliot and reverse elliot, steering knuckle.		
13 <sup>th</sup>	1 <sup>st</sup>	<b>6. Steering</b> Steering mechanism.		
	2 <sup>nd</sup>	function, Davis and Ackerman's Principle of steering.		
	3 <sup>rd</sup>	Working and constructional details of steering gear		
	4 <sup>th</sup>	steering linkages, sector arm, center arm		
14 <sup>th</sup>	1 <sup>st</sup>	drag link and tie rod steering stops.		
	2 <sup>nd</sup>	Front wheel geometry-castor, camber,		
	3 <sup>rd</sup>	steering axis inclination, toe in and toe out.		
	4 <sup>th</sup>	Cornering force, cornering power and self-righting torque		
15 <sup>th</sup>	1 <sup>st</sup>	Over steering and under steering.		
	2 <sup>nd</sup>	Power steering – necessity, types, Construction		
	3 <sup>rd</sup>	features and working of hydraulic and electronic power steering systems		
	4 <sup>th</sup>	Common steering systems troubles and remedies		

(Signature of the teacher concerned with date)

**Name of the Faculty** : Yet To be Assigned  
**Discipline** : (Automobile Engineering)  
**Semester** : 4<sup>TH</sup>  
**Subject** : MATERIALS AND METALLURGY  
**Lesson plan Duration** : 15 weeks(from January, 2018)  
**Workload per week in hours** : Lectures-03, Practicals-02

Week	Theory		Practical	
	Lecture Day	Topic(including assignment test)	Practical Day	Topic
1 <sup>st</sup>	1	Material, History of Material Origin, Scope of Material Science	1 <sup>st</sup>	Classification of about 25 specimens of materials/machine parts into  (i) Metals and non metals  (ii) Metals and alloys
	2	Overview of different engineering materials and applications,		
	3	Classification of materials, Thermal, Chemical, Electrical, Mechanical properties of various materials,		
2 <sup>nd</sup>	4	Present and future needs of materials, Overview of Biomaterials and semiconducting materials.,	2 <sup>nd</sup>	Classification of about 25 specimens of materials/machine parts into  (iii) Ferrous and non ferrous metals  (iv) Ferrous and non ferrous alloys
	5	Various issues of Material Usage-Economical, Environment and Social.		
	6	Crystallography Fundamentals: Crystal, Unit Cell, Space Lattice, Arrangement of atoms in Simple Cubic Crystals		
3 <sup>rd</sup>	7	BCC, FCC and HCP Crystals,	3 <sup>rd</sup>	Problems
	8	problems		
	9	Test		
4 <sup>th</sup>	10	Number of atoms per unit Cell, Atomic Packing Factor.	4 <sup>th</sup>	Given a set of specimen of metals and alloys (copper, brass, aluminium, cast iron,HSS, Gun metal); identify and indicate the various properties possessed by them.
	11	Deformation: Overview of deformation behaviour and its mechanisms;		
	12	Behavior of material under load and stress-strain.		
5 <sup>th</sup>	13	Failure Mechanisms: Overview of failure modes,	5 <sup>th</sup>	revision
	14	Assignment		

	<b>15</b>	fracture, fatigue and creep.		
<b>6<sup>th</sup></b>	<b>16</b>	Metals And Alloys Introduction: History and development of iron and steel	<b>6<sup>th</sup></b>	Study of heat treatment furnace.
	<b>17</b>	Different iron ores, Raw Materials in Production of Iron and Steel,		
	<b>18</b>	Basic Process of iron-making and steel-making,		
<b>7<sup>th</sup></b>	<b>19</b>	Classification of iron and steel,	<b>7<sup>th</sup></b>	To prepare specimens of following materials for microscopic examination and to  Examine the microstructure of the specimens of following materials:  i) Brass ii)Copper iii)Grey iv)Malleable v)Low carbon steel vi)High carbon steel  vii) HSS
	<b>20</b>	Test		
	<b>21</b>	Cast Iron: Different types of Cast Iron, manufacture and their usage.		
<b>8<sup>th</sup></b>	<b>22</b>	Steels: Steels and alloy steel, Classification of plain carbon steels,	<b>8<sup>th</sup></b>	To prepare specimens of following materials for microscopic examination and to  Examine the microstructure of the specimens of following materials:  i) Low carbon steel ii)High carbon steel  iii) HSS
	<b>23</b>	Simple problems.		
	<b>24</b>	Assignment		
<b>9<sup>th</sup></b>	<b>25</b>	Availability,Properties and usage of different types of Plain Carbon Steels,	<b>9<sup>th</sup></b>	To anneal a given specimen and find out difference in hardness as a result of annealing.
	<b>26</b>	Effect of various alloys on properties of steel,		
	<b>27</b>	Uses of alloy steels (high speed steel, stainless steel, spring steel, silicon steel)		
<b>10<sup>th</sup></b>	<b>28</b>	Simple problems.	<b>10<sup>th</sup></b>	Revision



	<b>29</b>	Non Ferrous Materials: Properties and uses of Light Metals and their alloys		
	<b>30</b>	properties and uses of White Metals and their alloys.		
<b>11<sup>th</sup></b>	<b>31</b>	Test	<b>11<sup>th</sup></b>	To normalize a given specimen and to find out the difference in hardness as a result of normalizing
	<b>32</b>	Theory of Heat Treatment ,Purpose of heat treatment,		
	<b>33</b>	Solid solutions and its types, Iron Carbon diagram,		
<b>12<sup>th</sup></b>	<b>34</b>	Formation and decomposition of Austenite, Martensitic Transformation –  Simplified Transformation Cooling Curves	<b>12<sup>th</sup></b>	Revision
	<b>35</b>	heat treatment processes hardening, tempering, annealing, normalizing, Case hardening and surface hardening, Types of heat treatment furnaces required for above operations (only basic idea)		
	<b>36</b>	Engineering Plastics  Important sources of plastics, Classification-thermoplastic and thermo set and their uses, speed.		
<b>13<sup>th</sup></b>	<b>37</b>	Various Trade names of engg. Plastics, Plastic Coatings.	<b>13<sup>th</sup></b>	Revision
	<b>38</b>	Advanced Materials  Composites-Classification, properties, applications Ceramics-Classification,		
	<b>39</b>	properties, applications Heat insulating materials		
<b>14<sup>th</sup></b>	<b>40</b>	Miscellaneous Materials  Properties and uses of Asbestos, Glass wool, thermocole, cork, mica	<b>14<sup>th</sup></b>	To harden and temper a specimen and to find out the difference in hardness due to tempering.
	<b>41</b>	Overview of tool and die materials, Materials for bearing metals, Spring materials,		
	<b>42</b>	Materials for Nuclear Energy, Refractory materials.		
<b>15<sup>th</sup></b>	<b>43</b>	Simple problems.	<b>15<sup>th</sup></b>	Revision
	<b>44</b>	Assignment		
	<b>45</b>	Test		