

**GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT**

Department of Mechanical Engineering

Academic Year: **2017**Semester: **EVEN****COURSE PLAN**Semester: **VIII**

Subject Code&amp; Name: 10ME844 &amp; Automotive Engineering

Name of Subject Teacher: **NAVANEETH B**

Name of Subject Expert (Reviewer):

For the Period: From: 06-02-17 to 19/05/17

Details of Book to be referred:

Text Books (TB)	<ol style="list-style-type: none"><li>1. <b>Automotive Mechanics</b>, S. Srinivasan, 2<sup>nd</sup> Ed., Tata McGraw Hill 2003.</li><li>2. <b>Automobile Engineering</b>, P B Nagraj, M/S. Sudha Publications</li></ol>
Reference Books (RB)	<ol style="list-style-type: none"><li>1. <b>Automobile engineering</b>, Kirpal Singh. Vol I and II 2002.</li><li>2. <b>Automobile Engineering</b>, R. B. Gupta, Satya Prakashan, 4<sup>th</sup> edn. 1984, R. B. Gupta, Satya Prakashan, 4<sup>th</sup> edn. 1984</li></ol>

	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	<b>Unit 1: Engine Components And Cooling &amp; Lubrication Systems:</b> Introduction	<b>Objective:</b> To understand various engine components its operations and applications. <b>Applications:</b> In automotive engines like in cars, buses, bikes, marine, aircraft etc <b>Outcomes:</b> student will able to understand each and every part of an engine and the significance of the cooling and lubrication system in the Automotive engine	TB 2 Pg No. 1 to 2	06/02/17				
2.	Spark Ignition (SI) & Compression Ignition (CI) engines, Cylinder – arrangements and their relatives merits		TB 2 Pg No. 2 to 9	07/02/17				
3.	Liners, Piston		TB 2 Pg No. 10 to 15	08/02/17				
4.	Connecting rod, crankshaft, valves		TB 2 Pg No. 15 to 18	08/02/17				
5.	Valve actuating mechanisms		TB 2 Pg No. 18 to 21	09/02/17				
6.	Valve and port timing diagrams		TB 2 Pg No. 21 to 23	13/02/17				
7.	Types of combustion chambers for S.I.Engine and C.I.Engines		TB 2 Pg No. 23 to 25	14/02/17				
8.	Compression ratio, methods of a Swirl generation		TB 2 Pg No. 25 to 26	15/02/17				
9.	Choice of materials for different engine components, engine positioning, Cooling requirements, methods of cooling		TB 2 Pg No. 27 to 33	15/02/17				
10.	Thermostat valves, different lubrication arrangements		TB 2 Pg No. 33 to 38	16/02/17				
11.	<b>UNIT - 3 Superchargers And Turbochargers:</b> Introduction, Naturally aspirated engines, Forced Induction	<b>Objective:</b> To understand different methodologies to boost the performance of engine <b>Applications:</b> Commercial cars, racing vehicles, spacecrafts etc <b>Outcomes:</b> Students will understand various methods of improving engine performance	TB 2 Pg No. 69 to 72	20/02/17				
12.	Types of superchargers		TB 2 Pg No. 73 to 75	21/02/17				
13.	Turbocharger construction and operation		TB 2 Pg No. 75 to 77	22/02/17				
14.	Intercooler, Turbocharger lag		TB 2 Pg No. 77	22/02/17				

15.	<b>UNIT - 4 Ignition Systems:</b> Introduction, Battery Ignition systems	<b>Objective:</b> to learn various ignition which essential in starting of an engine and its smooth operation <b>Applications:</b> In all automotive vehicles <b>Outcomes:</b> students will able to understand different parts used in the ignition system and their functions	TB 2 Pg No. 79 to 82	23/02/17				
16.	Magneto Ignition system		TB 2 Pg No. 82 to 85	27/02/17				
17.	Transistor assist contacts Electronic Ignition		TB 2 Pg No. 85 to 87	28/02/17				
18.	Automatic Ignition advance systems.		TB 2 Pg No. 87 to 88	01/03/17				
19.	<b>UNIT – 8 Automotive Emission Control Systems:</b> Introduction, Automotive emission controls, Controlling crankcase emissions,	<b>Objective:</b> to understand different types of emissions and the different methods of controlling them. <b>Applications:</b> In all automotive vehicles <b>Outcomes:</b> Students will be able to know how to control harmful emissions and different emission standards	TB 2 Pg No. 205 to 207	01/03/17				
20.	Controlling evaporative emissions		TB 2 Pg No. 207 to 209	02/03/17				
21.	Cleaning the exhaust gas, Controlling the air-fuel mixture Controlling the combustion process, Exhaust gas recirculation		TB 2 Pg No. 209 to 212	06/03/17				
22.	Treating the exhaust gas, Air-injection system, Air-aspirator system		TB 2 Pg No. 212 to 213	07/03/17				
23.	Catalytic converter Emission standards- Euro I, II, III and IV norms, Bharat Stage II, III norms.		TB 2 Pg No. 213 to 217	08/03/17				
24.	<b>UNIT - 6 Drive To Wheels:</b> Introduction, Propeller shaft and universal joints	<b>Objective:</b> To understand the various drive systems of automobile and their working mechanisms. Also to understand steering geometry and conditions of perfect steering using different steering mechanisms <b>Applications:</b> In all automotive vehicles. <b>Outcomes:</b> Students will able to understand how the power is transmitted from engine to the	TB 2 Pg No. 129 to 132	08/03/17				
25.	Rear axle, rear axle drives, Hotchkiss drive		TB 2 Pg No. 132 to 134	13/03/17				
26.	Torque tube drives and rear axle shaft supporting		TB 2 Pg No. 135 to 137	14/03/17				
27.	Differential		TB 2 Pg No. 137 to 140	15/03/17				
28.	Steering, general arrangements of links and stub axle		TB 2 Pg No. 141 to 143	15/03/17				

29.	Steering geometry, camber, king pin inclination, included angle, castor, toe in & toe out	wheels using different mechanisms & also about true rolling and steering conditions for different road and vehicle conditions	TB 2 Pg No. 143 to 147	16/03/17					
30.	Condition for exact steering		TB 2 Pg No. 149 to 152	20/03/17					
31.	Steering gears, power steering		TB 2 Pg No. 148 to 152	21/03/17					
32.	Over steer, under steer and neutral steer, Types of chassis frames		RB 2 Pg No. 33-18 to 33-19 RB1 (vol II) 224 to 227	22/03/17					
33.	Numerical problems		TB 2 Pg No. 154 to 156	22/03/17					
34.	<b>UNIT - 2 Fuels, Fuel Supply Systems For SI And CI Engines:</b> Introduction, Conventional fuels, alternative fuels	<b>Objective:</b> To understand different types of fuels and different types of fuel supply systems of both SI and CI engines and the various parts used and their functions. <b>Applications:</b> In all automotive vehicles. <b>Outcomes:</b> Students will be able to understand various fuels used and their effect on engines, and also about the different fuel supply systems used in different SI and CI engines	TB 2 Pg No. 40 to 43	23/03/17					
35.	Normal and abnormal combustion, Cetane and Octane numbers		TB 2 Pg No. 43 to 44	27/03/17					
36.	Fuel mixture requirements for SI engines types of carburetors		TB 2 Pg No. 45 to 50	28/03/17					
37.	Solex and Zenith Carburetors		TB 2 Pg No. 50 to 54	30/03/17					
38.	S.U.& Cater carburetors		TB 2 Pg No. 54 to 57	03/04/17					
39.	Multi point and Single point fuel injection systems		TB 2 Pg No. 58 to 59	04/04/17					
40.	Fuel transfer pumps		TB 2 Pg No. 60 to 61	05/04/17					
41.	Fuel filters, fuel injection pumps and injectors		TB 2 Pg No. 61 to 67	05/04/17					
42.	<b>UNIT - 5 Power Trains:</b> Introduction, General arrangement of clutch, Principle of friction clutches		<b>Objective:</b> To understand the concept of power transmission from engine to drive systems by studying different transmission systems like clutches, gear boxes and their parts <b>Applications:</b> In all automotive	TB 2 Pg No. 90 to 92	06/04/17				
43.	Torque transmitted, Constructional details, Fluid flywheel, Single plate clutch			TB 2 Pg No. 92 to 94	10/04/17				

44.	Multi-plate and centrifugal clutches	vehicles. <b>Outcomes:</b> Students will know the use of various types of clutches and gear boxes used in automobiles and their working mechanisms. And also about the automatic transmissions system	TB 2 Pg No. 95 to 96	11/04/17				
56.	Gear box: Necessity for gear ratios in transmission, Synchronesh gear boxes		TB 2 Pg No. 97 to 101	12/04/17				
57.	3, 4 and 5 speed gear boxes		TB 1 Pg No. 18 to 21	12/04/17				
58.	Freewheeling mechanism, planetary gears systems		TB 2 Pg No. 104 to 106	13/04/17				
59.	Over drives, fluid coupling and torque converters		TB 2 Pg No. 107 to 112	20/04/17				
60.	Epicyclic gear box, principle of automatic transmission		TB 2 Pg No. 112 to 115	24/04/17				
61.	Calculation of gear ratios, Numerical calculations for torque transmission by clutches		TB 2 Pg No. 116 to 127	25/04/17				
62.	<b>UNIT - 7</b> <b>Suspension, Springs And Brakes:</b> Introduction Requirements, Torsion bar suspension systems	<b>Objective:</b> To understand the use of suspension systems and concept of braking systems in automobiles & also their working phenomenon. <b>Applications:</b> In all automotive vehicles. <b>Outcomes:</b> Students will be able to make use of the concept of various suspension systems and their mechanisms which is essential for smooth riding of the vehicles and their respective merits and demerits in different vehicles, and also about the calculations of stopping distance using different braking mechanisms	TB 2 Pg No. 158 to 159	26/04/17				
63.	Independent suspension for front wheel and rear wheel, Leaf spring, coil spring		TB 2 Pg No. 160 to 163	26/04/17				
64.	Shock absorbers, Air suspension system		TB 2 Pg No. 164 to 166	27/04/17				
65.	Types of brakes, Mechanical compressed air braking systems, Brake shoe arrangements		TB 2 Pg No. 167 to 172	02/05/17				
66.	Vacuum and hydraulic braking systems		TB 2 Pg No. 183 to 189	03/05/17				
67.	Construction and working of master and wheel cylinder		TB 2 Pg No. 185 to 187	03/05/17				
68.	Disk brakes, drum brakes		TB 2 Pg No. 178 to 180	04/05/17				
69.	Antilock –Braking systems, purpose and operation of antilock-braking system, ABS		RB 1 (Vol II) Pg No. 331 to 339	08/05/17				

	Hydraulic Unit, Rear-wheel antilock						
70.	Numerical Problems		TB 2 Pg No. 195 to 203	09/05/17			

Prepared By: \_\_\_\_\_  
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