

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II Sem (2 semester)			
Course Code	<b>FUNDAMENTALS OF AUTOMOBILE ENGINEERING</b>				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s): No Prerequisites are required		3	0	0	3

**Course Objectives:**

**To make the student able to**

1. Understand working of different automobile structures and layouts.
2. Recognize different types of automobile engines and different components in it.
3. Identify different transmission elements and control systems.
4. Distinguish the functions of Control systems.
5. Adopt Electric Power train Systems in Automobiles.

**Course Outcomes:**

On completion of the course, the students will be able to-	
CO1:	Compare different types of automobiles and their components.
CO2:	Differentiate working principles of different types of automobile engines.
CO3:	Illustrate working of different transmission elements and control systems.
CO4:	Demonstrate Automobile Control systems.
CO5:	Illustrate various Eco Friendly Vehicles.

**UNIT-I**

**Introduction to Automobiles:**

Functions and characteristics of different types of automobiles and their power sources. Specifications, Performance Parameters, Quality standards, Trends in automobile design.

**UNIT-II**

**Automobile Engines and their Systems:**

Engine Specifications with regard to power, speed, torque, no. of cylinders and arrangement, lubrication and cooling etc. Reciprocating Engines, Rotary Engines.

Engine Lubrication systems, Engine cooling system, Engine fuel systems, Engine intake & exhaust systems

Principles of Ignition system and starting system.

**UNIT-III**

**Transmission Systems:**

Clutches, principle of operations, types, cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches, fluid fly wheel-gear boxes, types, sliding mesh, constant mesh, synchro-mesh gear boxes, over drive, torque converter. Propeller shaft, Torque tube drive, universal joint & slip joint, Hotchkiss drive, differential rear axles-types-wheels and tyres.



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PVS N Hanuman  
(Alumnus)

## UNIT-IV

### Introduction to Control Systems:

Steering geometry-camber, castor, king pin rake, combined angle toe-in, center point steering.  
Mechanical, hydraulic, pneumatic & vacuum brakes-brief description.  
Rigid axle suspension and independent suspension, Shock absorbers, Different types of springs used in automobile suspension.

## UNIT-V

### Electric & Hybrid Vehicles:

Principles of Battery Electric Vehicles and its Components, Principles of Hybrid Electric Drive Trains and its Architecture.

### TEXT BOOKS:

1. Automotive Mechanics, William H Crouse and Donald L Anglin, Tata McGraw – Hill Publishing Co. Ltd. 2004, 10<sup>th</sup> Edition.
2. Automobile Engineering – R.B. Gupta.
3. Automobile Engineering (Vol. 1) – Dr. Kirpal Singh
4. Automobile Engineering (Vol. 2) – Dr. Kirpal Singh
5. Automobile Engineering – KK Ramalingam

### REFERENCES:

1. Automobile Engineering --- G.B.S. Narang.
2. IC Engines – V.Ganeshan/TMH
3. IC Engines – ML Mathur & RP Shurma
4. IC Engines – Domkundvar
5. BP Obert IC Engines & Air Pollution – Harper & Row pub.
6. Bosch Gasoline Engines Management – Bosch Pub.
7. Bosch Diesel Engine Management – Bosch Pub.

### CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], ‘-‘ : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	1	-	-	-	-	-	-
CO2	3	2	-	-	-	1	-	-	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	2	-	1	1
CO5	2	2	-	-	-	-	3	-	-	-	-	-



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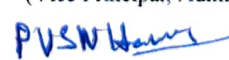
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