B.E Semester: VIII

Automobile Engineering

Subject Name: Elective-II: New generation and hybrid vehicles **(AE805B)**

Course Objective

- To present a problem oriented in depth knowledge of new generation and hybrid vehicles.
- To address the underlying concepts and methods behind new generation and hybrid vehicles.

Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVA	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
AE805B	Elective-II: New generation and hybrid vehicles	4	0	0	4	4	3	70	30	20	-	120

Detailed Syllabus:

Topic no	Details
1	**INTRODUCTION** Electric and hybrid vehicles, flexible fuel vehicles (FFV), solar powered vehicles, magnetic track vehicles, fuel cells vehicles.
2	**POWER SYSTRM AND NEW GENERATION VEHICLES** Hybrid Vehicle engines, Stratified charge engines, learn burn engines, low heat rejection engines, hydrogen engines, HCCI engine, VCR engine, surface ignition engines, VVTI engines. High energy and power density batteries, fuel cells, solar panels, flexible fuel systems.
3	**VEHICLE OPERATION AND CONTROL** Computer Control for pollution and noise control and for fuel economy – Transducers and actuators - Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.
4	**VEHICLE AUTOMATED TRACKS** Preparation and maintenance of proper road network - National highway network with automated roads and vehicles - Satellite control of vehicle operation for safe and fast travel, GPS.
5	**SUSPENSION, BRAKES, AERODYNAMICS AND SAFETY** Air suspension – Closed loop suspension, compensated suspension, anti skid braking system, retarders, regenerative braking, safety gauge air backs- crash resistance. Aerodynamics for modern vehicles, safety systems, materials and standards.

Lesson planning

SR.NO	DATE/WEEK	UNIT NO	%WEIGHTAGE	TOPIC NO
1	1^{st} , 2^{nd} , 3^{rd}	Unit 1	20%	1
2	4^{th} ,5^{th} , 6^{th}	Unit 2	20%	2
3	7^{th} ,8^{th} , 9^{th}	Unit 3	20%	3
4	10^{th} ,11^{th} , 12^{th}	Unit 4	20%	4
5	13^{th} ,14^{th} , 15^{th}	Unit 5	20%	5

Instructional Method & Pedagogy

- At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
- Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
- One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.

Students Learning Outcomes

- The student can identify different areas of new generation and hybrid vehicles.
- Can find the applications of all the areas in day to day life.

Recommended Demonstrate Materials

- Modern Vehicle Technology by Heinz.
- Bosch Hand Book, SAE Publication,, 2000
- Light weight electric for hybrid vehicle design.
- Advance hybrid vehicle power transmission, SAE.