

B.E Semester: VII
Automobile Engineering
Subject Name: Elective-I: Automotive safety (AE706A)

Course Objective:

- To present a problem oriented in depth knowledge of automotive safety.
- To address the underlying concepts and methods behind automotive safety.

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	
AE706A	Elective-I: Automotive safety	4	0	0	4	4	3	70	30	20	-	120

Detailed Syllabus:

Topic no	Details
1.	INTRODUCTION Design of the body for safety, energy equation, engine location, deceleration of vehicle inside passenger compartment, deceleration on impact with stationary and movable obstacle, concept of crumble zone, safety sandwich construction.
2.	SAFETY CONCEPTS Active safety: driving safety, conditional safety, perceptibility safety, operating safety passive safety: exterior safety, interior safety, deformation behavior of vehicle body, speed and acceleration characteristics of passenger compartment on impact.
3.	SAFETY EQUIPMENTS Seat belt, regulations, automatic seat belt tightener system, collapsible steering column, tilt able steering wheel, air bags, electronic system for activating air bags, bumper design for safety.
4.	COLLISION WARNING AND AVOIDANCE Collision warning system, causes of rear end collision, frontal object detection, rear vehicle object detection system, object detection system with braking system Interactions.
5.	COMFORT AND CONVENIENCE SYSTEM Steering and mirror adjustment, central locking system , Garage door opening system, tyre pressure control system, rain sensor system, environment information system

Lesson Planning:

Sr.No.	Date/Week	Unit No.	% Weightage	Topic No
1	1 st ,2 ^{ed} ,3 ^{ed}	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 weight age 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 automotive safety.
- Can find the applications of all the areas in day to day life.

Recommended Study Materials

Text & Reference Books:

- Bosch - "Automotive Handbook" - 5th edition - SAE publication - 2000.
- J.Powloski - "Vehicle Body Engineering" - Business books limited, London - 1969.
- Ronald.K.Jurgen - "Automotive Electronics Handbook" - Second edition- McGraw-Hill Inc., - 1999.