

## B.E Semester: VIII

### Mechanical Engineering

#### Subject Name: Automobile Body Engineering

##### A. Course Objective

- To develop a solution oriented approach by in depth knowledge of Automobile Body Engineering.
- To address the underlying concepts, methods and application of Automobile Body Engineering.

##### B. Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
ME805-A	Automobile Body Engineering	4	0	0	4	4	3	70	30	20	0	120

##### C. Detailed Syllabus

###### 1. Vehicle Aerodynamics:

Objectives ,Vehicle drag and types ,various types of forces and moments ,effects of forces and moments ,side wind, various body optimization techniques and Aerodynamic Aids for Optimization of drag ,wind tunnel testing of scale model, component balance to measure forces and moments.

###### 2. Car Body:

Types, Regulations, drivers visibility, tests for visibility, methods for improving visibility and space in cars, safety design, safety requirements for car, car body construction, Crash Test and Roll over test regulations, Heating and ventilation systems, dash board instruments.

###### 3. Bus Body Details:

Types, Mini bus, single decker, double decker, two level, split level and articulated bus, bus body layout, floor height, engine location, entrance and exit locations, passenger seating dimensions, constructional details, frame construction, double skin construction, types of metal sections. Types of body, Flat platform, drop side, fixed side, tipper body, tanker body. Light commercial vehicle body types, Dimensions of driver's seat in relation to controls, driver's cabin design.

**4. Body Materials:** Metal sheets (Steel, Aluminum etc.), plastics, timber, GRP, FRP, Insulating materials, adhesives and sealants. Wind screen, Back light & window Glasses and regulations for glasses. Difference between toughened glass, sheet glass & laminated glass. Composite materials, properties of materials, corrosion, anti-corrosion methods, selection of paint and painting process, body trim items, body mechanisms.

**6. Body Loads:** Idealized structure, structural surface, shear panel method, symmetric and asymmetric vertical loads in a car, longitudinal load, different loading situations, chassis frame design, Construction of Doors, door apertures, windows. Spare wheel carrier construction and design for different types of vehicle and weight distribution criteria in relation to Spare wheel location. Sources of body noises testing and methods of elimination. Water leakage test.

**7. Automobile body repair and servicing:** Interior trim and upholstery, Glass and door service, Body insulation and sealing, Exterior trim, major and minor body repairs

**D. Lesson planning**

<u>SR. NO.</u>	<u>DATE/WEEK</u>	<u>UNIT NO.</u>	<u>%WEIGHTAGE</u>	<u>TOPIC NO.</u>
1	1 <sup>ST</sup> , 2 <sup>ND</sup> , 3 <sup>RD</sup>	1, 2	20	1, 2
2	4 <sup>TH</sup> , 5 <sup>TH</sup> , 6 <sup>TH</sup>	3	20	3
3	7 <sup>TH</sup> , 8 <sup>TH</sup> , 9 <sup>TH</sup>	4	20	4
4	10 <sup>TH</sup> , 11 <sup>TH</sup> , 12 <sup>TH</sup>	5	20	5
5	13 <sup>TH</sup> , 14 <sup>TH</sup> , 15 <sup>TH</sup>	6, 7	20	6, 7

**E. Instructional Method & Pedagogy**

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. 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.
3. Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4. 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.
5. 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.
6. Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.
8. **Practical / Oral:** Term work shall be carried out to fulfill the practical credits related to course contents.

**F. Students Learning Outcomes**

- The student can identify different areas of Industrial Automobile Body Engineering.
- Can find the applications of all the areas in day to day life.

**G. Recommended Study Materials**

**Text & Reference Books:**

1. Crouse W. H. & Anglin D. L., "Automotive Chassis", McGraw-Hill Int. Book Co.2009
2. P. L. Kohli, "Automotive Chassis & Body", Papyrus Publishing House, New Delhi.2010
3. J Powloski, "Vehicle Body Engineering", Business Books Ltd., London
4. Sydney F. Page, "Body Engineering", Chapman & Hill Ltd., London, 3rd Edition
5. J Fairbrother, "Fundamentals of Vehicle Body work", Hutchinson, London.
6. P.M. Heldt, "Automotive Chassis", Chilton Co. NK
7. John Fenton, "Vehicle Body Layout & Analysis", Hutchinson, London.
8. J.G. Giles, "Body Construction and Design", Vol. 6., Iife Books/Butterworth & Co. London