

B.E Semester: V
Automobile Engineering
Subject Name: Automobile chassis and body engineering (AE506)

Course Objective:

- To present a problem oriented in depth knowledge of automobile chassis and body engineering.
- To address the underlying concepts and methods behind automobile chassis and body engineering.

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	
AE506	Automobile chassis and body engineering	3	0	0	3	3	3	70	30	20	00	120

Detailed Syllabus:

Topic no	Details
1.	Vehicle Aerodynamics: Types of Chassis frames & body, aerodynamic consideration in body profiling, ergonomic consideration, defects in frame and body. 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.
2.	Car Body Details : Types, Regulations, Drivers seat design & dimensions parameters, drivers visibility, methods for improving visibility and space in cars, design for safety, safety requirements for car (with reference to Vehicle Body Engineering), car body construction. Crash Test and Roll over test regulations. Heating and ventilation systems. Dash boards, instrument panel and passenger compartment lighting, Audio – visual systems.
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 , seat layout for RTO registration, constructional details, frame construction, double skin construction, types of metal sections used, conventional and integral coach type construction. Bus body Code Regulations (ARAI). Pneumatic equipment for passenger door opening & closing. Air conditioning equipment selection and mounting.
4.	Commercial Vehicle Details: 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, drivers cab design. Tipper body designs, volume/weight considerations, pay load and related regulations.
5.	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.
6.	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.

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 %	5,6

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 automobile chassis and body engineering.
- Can find the applications of all the areas in day to day life.

Recommended Study Materials

- **Text & Reference Books:**
 1. “Automotive Chassis & Body”, by P.L.Kohli, Papyrus Publishing House, New Delhi.
 2. “Automotive Chassis”, by Crouse W.H.& Anglin D.L, McGraw-Hill Int. Book Co.
 3. “Body Engineering”, by Sydney F. Page, Chapman & Hill Ltd., London.
 4. “Fundamentals of Vehicle Body work”, by J. Fairbrother, Hutchinson, London.
 5. “Automotive Chassis”, by P.M. Heldt, Chilton Co. NK
 6. “Vehicle Body Layout & Analysis”, by John Fenton, Hutchinson, London.
 7. “Vehicle Body Engineering”, by J. Powloski, Business Books Ltd., London.