

1152AU108

**VEHICLE BODY ENGINEERING**

**L T P C**

**3 0 0 3**

**1. Preamble**

This course imparts knowledge in the construction of vehicles, concept aerodynamics, and different types of car and passenger bus bodies.

**2. Pre-requisite**

1151AU214 Automotive Chassis

**3. Links to other courses**

- Vehicle Design & Data Characteristics
- Automotive Chassis
- I.C Engines
- Automotive Safety

**4. Course Educational Objectives**

Students undergoing this course are expected

- To develop the basic knowledge of the students in design of the vehicle body to give maximum comfort for the passengers and exposed to the methods of stream lining the vehicle body to minimize drag.
- To develop the skills of the students in the areas of car body design, bus body design, active and passive safety.

**5. Course outcomes**

Upon the successful completion of the course, students will be able to

<b>CO Nos.</b>	<b>Course Outcomes</b>	<b>Level of learning domain (Based on revised Bloom's)</b>
CO1	Discuss the different types of car body design and its safety features.	K2
CO2	Select a suitable body optimization techniques to minimize drag and able to describe the wind tunnel testing procedure.	K2
CO3	Classify the various types of bus body construction and able to identify the body layout.	K2
CO4	Describe the different types of commercial vehicles and its design.	K2
CO5	Explain the various types of materials and painting techniques used in automobiles.	K2

## 6. Correlation of COs with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	H	M	H			L				L		M	L
CO2	H	H	M	H			L				L		H	M
CO3	H	H	M	H			L				L		M	M
CO4	H	H	M	H			L				L		L	H
CO5	H	H	M	H			L				L		H	H

H- High; M-Medium; L-Low

## 7. Course content

### UNIT I CAR BODY

L-9

Types - Saloon, Convertibles, Limousine, Estate Car, Racing and Sports Car. Visibility - Regulations, Driver's Visibility, Tests For Visibility, Methods of Improving Visibility and Space In Cars. Safety - Safety Design, Safety Equipments For Cars. Car Body Construction - Design Criteria, Prototype Making, Initial Tests, Crash Tests on Full Scale Model, Dummies and Instrumentation

### UNIT II VEHICLE AERODYNAMICS

L-9

Objectives - Vehicle Drag and Types - Various Types of Forces and Moments, Effects of Forces and Moments, Side Wind Effects on Forces and Moments, Various Body Optimization Techniques For Minimum Drag, Wind Tunnel Testing - Flow Visualization Techniques, Scale Model Testing, Component Balance to Measure Forces And Moments.

### UNIT III BUS BODY

L-9

Types - Mini Bus, Single Decker, Double-Decker, Two Level and Articulated Bus. Bus Body Layout - Floor Height, Engine Location, Entrance and Exit Location, Seating Dimensions. Constructional Details - Frame Construction, Double Skin Construction, Types of Metal Sections Used, Regulations, Conventional And Integral Type Construction.

### UNIT IV COMMERCIAL VEHICLE

L-9

Types of Body - Flat Platform, Drop Side, Fixed Side, Tipper Body, Tanker Body And Haulage Vehicle. Light Commercial Vehicle Body Types. Dimensions of Driver's Seat Relation to Controls. Drivers Cab Design.

### UNIT V BODY MATERIALS, TRIM AND MECHANISMS

L-9

Steel Sheet, Timber, Plastic, GRP, Properties of Materials - Corrosion, Anticorrosion Methods. Selection of Paint And Painting Process. Body Trim Items. Body Mechanisms.

**TOTAL: 45**

**periods**

## 8. Text Books

1. J.Powloski - "Vehicle Body Engineering" - Business Books Ltd, London -1989

## 9. References

1. Giles.J.C.- "Body construction and design"- Liiffe Books Butterworth & Co. - 1971.
2. John Fenton - "Vehicle Body layout and analysis" - Mechanical Engg. Publication Ltd., London – 1982.
3. Braithwaite.J.B. - "Vehicle Body building and drawing" - Heinemann Educational Books Ltd., London – 1977.