



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Master of Engineering**  
**Subject Code: 3722104**  
**AUTOMOTIVE CHASSIS & BODY ENGINEERING**  
**SEMESTER: II**

**Type of course:** Program Elective - IV

**Prerequisite:** -.Nil

**Rationale:** The knowledge and skills of vehicle body technology is required to manage vehicle body fabrication and repair. Chassis and body forms the core of automobile engineering. The subject aims at imparting knowledge and skills regarding chassis and body structure, viz, improving the driver visibility, safety aspect in design. This course is designed to provide students the required level of knowledge and skills of automotive chassis and body engineering.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

**Content:**

Sr. No.	Content	Total Hrs	% Weightage
1	<b>Unit-I Vehicle Aerodynamics;</b> Objects- vehicle drag and types; various types of forces and moments; effects of forces and moments; various body optimization techniques for minimum drag; principle of wind tunnel technology; flow visualization techniques; tests with scale models.	12	29
2	<b>Unit-II Car Body Details;</b> Types of car bodies; visibility; regulation;, driver's visibility; methods of improving visibility; safety design; constructional details of roof; under floor; bonnet; boot; wings etc; Classification of coach work.	14	33
3	<b>Unit-III Design of Vehicle Bodies; Vehicle body materials;</b> Layout of the design; preliminary design; safety; Idealized structure; structural surface; shear panel method; symmetric and asymmetrical vertical loads in car; longitudinal loads; different loading situations; load distribution on vehicle structure; Calculation of loading cases; stress analysis of bus body structure under bending and torsion; stress analysis in integral bus body; Design of chassis frame; Rules and regulations for body; Recent safety measures; Testing of body.	16	38

**Reference Books:**

Reference Books:

1. Vehicle Body Engineering – Pawloski J., Business Books Ltd.
2. The Automotive Chassis: Engineering Principles – Reimpell J.
3. Vehicle Body Layout and Analysis – John Fenton, Mechanical Engg. Publications



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Ltd. London

4. Body Construction and Design – Giles J. G., Illife Books, Butterworth and Co

## Course Learning Outcome:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand , analyze , evaluate vehicle aerodynamics	20
CO-2	Acquire knowledge of various optimization techniques for minimizing flow visualization techniques	18
CO-3	Understanding of car bodies its accessories , safety considerations	22
CO-4	Understanding of vehicular design; preliminary design with safety considerations	18
CO-5	Force analysis, design of chassis and vehicular testing	22

After successful completion of the course, student will be able to:

- Understand the basic concept of vehicle aerodynamics
- Understand the car body details
- Understand design of vehicle bodies

## List of Experiments:

1. To take measurements of an automotive vehicle Chassis.
2. To study testing of Vehicle body.
3. To study various optimization techniques for minimizing flow visualization techniques.
4. To study Types of car bodies, visibility and its regulation.
5. To study design aspects of roof, under floor and bonnet.
6. To study different types of aerodynamics drag reducing device used in modern car.
7. To study different types of load conditions in car.
8. To study and demonstrate different types of safety systems used in modern car.