

ATC 225 - Automobile Body Engineering

(02 credits – 50 marks)

Learning Objectives:

The course should enable students:

1. Identify various forces and moments associated with aerodynamics.
2. Explain construction of various car bodies and importance of aesthetic, ergonomics and safety in the designing of vehicle body.

Learning Outcomes:

After completion of the course, students are expected to be able to:

1. To understand the physics of fluid flow over vehicle body and its optimization techniques.
2. Describe repair methods of body and repainting.
3. Identify painting defects and describe their causes and remedies.

Course Content:

Module –I: Vehicle Aerodynamics:

(05 Hours)

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.

Module –II: Car Body Details:

(04 Hours)

Types of car bodies, visibility, regulations, driver's visibility, methods of improving visibility, safety design, constructional details of roof, under floor, bonnet, boot, wings etc, Classification of coach work,

Module –III: Design of Vehicle Bodies:

(08 Hours)

Vehicle body materials, 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.

Module –IV Frame and Body repair

(07 Hours)

Frame repairs (for cracks, loose rivets, and skewness in frames) and alignments, Body repairs- Procedure to remove dent, denting tools and equipments, Adjustment of doors and locks, Repainting procedure, patch work, Painting defects

Module –V: Assignments / seminars / case studies on Module -I to Module – IV (6 Hrs)

References

1. Vehicle Body Engineering – Pawloski J., Business Books Ltd., ISBN 10: 0220689164
2. The Automotive Chassis: Engineering Principles – Reimpell J., ISBN: 9781493302864
3. Vehicle Body Layout and Analysis – John Fenton, Mechanical Engg. Publications Ltd. London, ISBN: 9780852984451
4. Body Construction and Design – Giles J. G., Illife Books, Butterworth and Co., ISBN: 1-4051-5592-2.