

<b>7<sup>th</sup> Semester</b>	<b>RAU7D005</b>	<b>Automotive Aerodynamics</b>	<b>L-T-P 3-0-0</b>	<b>3 Credits</b>
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**MODULE I****INTRODUCTION**

Scope, historical developments, fundamental of fluid mechanics, flow phenomenon related to vehicles, external and internal flow problem, resistance to vehicle motion, performance, fuel consumption and performance potential of vehicle aerodynamics.

**MODULE II****AERODYNAMIC DRAG OF CARS**

Resistance to vehicle motion, performance, fuel consumption and performance potential of vehicle aerodynamics, Cars as a bluff body, flow field around car, drag force, types of drag force, analysis of aerodynamic drag, drag coefficient of cars, strategies for aerodynamic development, low drag profiles.

**MODULE III****SHAPE OPTIMIZATION OF CARS**

Front end modification, front and rear wind shield angle, boat tailing, hatch back, fast back and square back, dust flow patterns at the rear, effects of gap configuration, effect of fasteners. The origin of forces and moments on a vehicle, the effects of forces and moments, characteristics of forces and moments, dirt accumulation on the vehicle, wind noise, drag reduction in commercial vehicles.

**MODULE IV****WIND TUNNELS FOR AUTOMOTIVE AERODYNAMICS**

Introduction, types and principle of wind tunnel technology, limitation of simulation, stress with scale models, full scale wind tunnels, measurement techniques, wind tunnel testing: flow visualization techniques, scale model testing, component balance to measure forces and moments. road testing methods, numerical methods.

**Books:**

1. Hucho.W.H. - "Aerodynamic of Road Vehicles" - Butterworths Co., Ltd., - 1997.
2. A. Pope - "Wind Tunnel Testing " - John Wiley & Sons - 2nd Edition, New York -1974.
3. Automotive Aerodynamic: Update SP-706 - SAE - 1987 3. Vehicle Aerodynamics - SP-1145 - SAE - 1996.