

Aerodynamics and its application for vehicles (Detailed thematics)

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September 7, 2010

Date	Topic
09.09.2010	Introduction (recall): aerodynamics (definition, areas), streamlined bodies, circulation, vortex, vorticity, bluff bodies, aerodynamic scaling, aerodynamic coefficient definitions
16.09.2010	Airfoils I. Experimental facts, theoretical approximation (the thin airfoil theory)
23.09.2010	Airfoils II. Thin airfoil theory for cambered airfoils. Airfoils with flaps. Arbitrary thick airfoils, the panel method
30.09.2010	Finite wing theory. Wing twisting. Wing sweep. Winglets. Wing-body interference.
07.10.2010	Experimental and theoretical determination of the drag and lift of airfoils. Approximate calculation of boundary layer properties on airfoils
14.10.2010	Delta wing aerodynamics, the vortex lift, lifting bodies
21.10.2010	Compressibility effects: measuring compressible flows, subsonic flow, transsonic flows, the area rule for aircraft
28.10.2010	Supersonic aerodynamics: supersonic airfoils, supersonic aircraft, shock-boundary layer interaction, engine integration
04.11.2010	Bluff body aerodynamics: the separation of boundary layer, characteristics of separation bubbles/zones, their effects on the flow, detection techniques. Description of 3D flow fields
11.11.2010	Flow visualization in aerodynamics (Wind tunnel demonstration)
18.11.2010	Aerodynamics of road vehicles: Passenger cars
25.11.2010	Aerodynamics of road vehicles: trucks, buses, race cars
02.12.2010	Basics of flow control: control without flow separation, control techniques with flow separation, high lift devices
09.12.2010	—