Tasks in subject Vehicle aerodynamics (ground vehicles) 1st mid term exam.

1. Concepts and approaches in development of car design, including aerodynamics, methods, main characteristics, time spans.

2. Aerodynamic characteristics of flow past streamlined and bluff bodies. Streamlines at streamlined and bluff bodies and estimation of pressure coefficient distribution.

3. Expression of force acting on a body exposed to flow by pressure and shear force coefficients. Order of magnitude of pressure and shear force coefficients. Comparison of pressure and shear stress related drag force at bluff and streamlined body.

4. Drag acting on brick shaped bluff body of quadratic cross section: streamlines, pressure coefficient distribution, local drag coefficient values in case of sharp leading edges. (Flow direction is parallel to the longitudinal symmetry axis.)

5. Drag acting on brick shaped bluff body of quadratic cross section: streamlines, pressure coefficient distribution, local drag coefficient values in case of rounded leading edges. (Flow direction is parallel to the longitudinal symmetry axis.) Diagram: drag coefficient as function of dimensionless rounding radius, effect of turbulence generator (wire).

6. Effect of boat tailing of a cylindrical body of rounded front face on the drag coefficient (with justification of the effect).

7. Interaction of front spoiler and rounding up of upper horizontal leading edge of cars in terms of drag reduction.

8. List and define the force and moment coefficients related to a car.