TECHNOLOGICAL EDUCATION INSTITUTE OF

CENTRAL MACEDONIA

SCHOOL OF TECHNOLOGICAL APPLICATIONS

DEPARTMENT OF MECHANICAL ENGINEERING

Graduate Studies Program: Academic Year 2015 - 16	"Renewable Energy Systems: Design, Development and Optimization"

Dimitrios Sofialidis

Subject:

3D CFD Analysis of a Sport Car Downforce-Producing Airfoil

Introduction & Motivation:

This is a typical example of external aerodynamics analysis in the automotive industry. A given sport car will be modified to include a back airfoil, designed to produce the desired downforce at specific speed range.

Several turbulence models will be tested and assessed with reference to the air flow field, especially the separation region on the car body and the wake behind it.

Implementation & Means:

The flow field will include only half car, because of geometric and flow symmetry.

The car body will be provided from a suitable 3D CAD file. The airfoil will be designed from the student and will have an appropriate cross-section and a specific length comparable to the car width. The attachment on the car body will done with simple side metal sheets.

ANSYS DesignModeler will be used for the airfoil geometry creation, ANSYS Meshing for the mesh generation and ANSYS Fluent for the computations.

References:

[1]
[2]

Requirements: *Knowledge needed for a successful dissertation.*