

DESCRIPTION OF THE EDUCATIONAL ACTIVITY

Academic year: **2010-2011**

Course title: **Fluid Mechanics**

Course number:

Type of educational activity: **mandatory class**

Subject Group: **ING-IND/06**

Year of study: **2nd year "Laurea"**

Semester: **2nd**

Total number of credits: **6**

Global workload (n. of hours) : **150**

Number of hours allocated to: lectures, tutorials, laboratory, individual study: **36,24,0,90**

Name of lecturer: **Paolo Luchini**

Objectives of the course: **knowledge of the fundamental equations of fluid mechanics and ability of correctly proportioning those fluid systems which are governed by a simple one-dimensional balance.**

Prerequisites: **Physics I, Mathematics II.**

Course contents:

The continuum description of matter. Fluid statics: force exerted by a fluid on submerged walls or floating bodies. Equations of balance in a finite volume: thrust of a jet and inertial force on a bend. Equations of balance in an infinitesimal volume: elementary solutions of the Navier-Stokes equations. Bernoulli law. Streams of negligible acceleration. Potential flow. Boundary layer. Turbulent flow in ducts: Moody's diagram and lumped head losses. Compressible flow: convergent-divergent nozzle and straight pipe with friction.

Recommended reading: **Pnueli, C. Gutfinger: Meccanica dei Fluidi (Zanichelli 1995), G. K. Batchelor: An Introduction to Fluid Dynamics (Cambridge University Press 2000).**

Teaching methods: **lectures, tutorials, movies of classical experiments**

Assessment methods: **oral examination with optional written test**

Language of instruction: **Italian**

Additional information: **further information can be requested via e-mail: fgiannetti@unisa.it**