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 submersed 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***