**Fluid Mechanics**

Language: the course is offered in Serbian and Hungarian.

***Goals:***

The aim of the course is to teach students the basic principles and laws in fluid mechanics. The deeper understanding of the basic equations of fluid mechanics will help the student to successfully apply them in order to both find the solution to specific engineering problems and to improve the student’s scientific and practical knowledge.

***Theoretical teaching includes the following topics:***

 Physical and mathematical models, principles and phenomena of fluid mechanics; Physical and mathematical foundations of fluid mechanics; Forces, the general state of stress and stress models in fluids; General equations in fluid mechanics; Laws of conservation; Conservation of mass, momentum and energy; Dynamics of inviscid fluid; Two-dimensional potential flow of inviscid fluid; Application of hydrodynamic singularities and theory of analytical functions of complex variable; Basic and complex potential flows; Combined straight line flow and sink, doublet; Flow past a cylinder; Kutta-Joukowski`s low; Dynamics of viscous flow; Navier-Stokes equation; Steady, laminar flow of Newtonian incompressible fluid; Exact analytical solutions of the Navier-Stokes equation; Hydrodynamic lubrication theory; Turbulent flows of incompressible fluid; Reynolds equation; Turbulent stress models; Turbulent flow in a hydraulically smooth and hydraulically rough pipe; Boundary layer theory; Prandtl theory; Boundary layer over a flat plate; Application of integral methods to boundary layer calculation; One-dimensional model of fluid flow; Basic equations of one-dimensional flow; One dimensional flow of incompressible fluid; One-dimensional flow of compressible fluid; Adiabatic and isothermal compressible flow with friction; Shock waves; Inviscid gas flow with heat exchange; Gas flow in the convergent, divergent and Laval nozzle.