Course: Fluid Mechanics

Lectures: aims and tasks of fluid mechanics. Some notions of fluid mechanics. Principles of conservations: mass (continuity equqtion), momentum and moment of momentum. Forces acting of fluid. Euler equation. Some applications of the Bernoulli equation. Newtonian fluids. Navier-Stokes equation and some solutions to the Navier-Stokes equation. Static of fluids. Reaction of liquid on a plane wall and curved walls. Condition of floating bodies. Flow of liquid in tubes and another channel. Flow filtration in the groud.

Exercises: Solving equilibrium equations related to fluid statics. Fluid pressures on flat, curved surfaces and the buoyancy force. Some solutions to the Navier-Stokes equation and Bernoulli equations for ideal and viscous flows. Energy losses of flowing fluid in pipelines.

Laboratory: Measurements of basic hydraulic quantities: measurements of pressure and fluid viscosity. The flow of viscous fluid in a pipeline with a small diameter. Distribution of air flow velocity in the cross-section of the ventilation pipeline. Local flow losses in pipelines (orifice and curved pipeline). Measurements of operating parameters of hydraulic devices: characteristics of a centrifugal pump and fan. Study of the stream and free streams of air.

Responsible person: Marta Gortych, PhD Eng.

More info:
https://webapps.uz.zgora.pl/syl/index.php?/course/showCourseDetails/1222311