Title ofCourse	**Fluid mechanics**		
Semester	**Autumn/Spring**		
Teaching Hours per Course:	**Total**	**- Lectures:**	**- Tutorials:**
	60	30	30
ECTS Credits	5		

The content of education	
Aims ofCourse	The course is concerned with basic knowledge of the fluid mechanics and the associated engineering applications. The aim of the course is knowledge and understanding of basic ideas, phenomena, and laws that govern of fluid flow, which may be incompressible in liquids and compressible in gases. Thermomechanics and thermodynamics are considered for that purpose. The application of the gained knowledge in industrial equipment design is considered as well. It may be done by determining of flow and thermal parameters in various industrial facilities and in environment as well.
Program	L1-2 – Basic ideas. Fluid properties. Investigating methods in fluid mechanics. Fluid mechanics applications; L3-4 – Hydrostatic: forces that act of fluids, hydrostatic pressure. Fluids equilibrium equations. Pascal's Law. Normal and tangent pressure. Floating bodies equilibrium; L5-6 - Kinematics of fluid flow: analytical studies of fluid motions, basic ideas of fluid flow theories, continuity equation; L7-8 - Bernoulli equation application for velocity and volumetric rate measurements; L9-10 – Liquid outflow off holes, gasous outflow off holes and nozzles – Laval nozzle; L11-12 – Hydrodynamical reactions. Fluid dynamics basis: newtonian and non-newtonian fluids; L13-14 – Bernoulli equation for viscous liquid, laminar and turbulent flow – Reynolds experiment; L15-16 – Viscous flow in channels: basic relations, drag coefficients, local and linear drag, pipeline calculations; L17-18 – Transient flow in pressured channels, hydraulic impact; L19-21 – Compressible flow theory. Mach number. Shockwaves. Investigation methods in gases. L22-23 – Boundary layer theory. Boundary layer properties. Boundary layer detachment phenomena; L24 – Computational Fluid Dynamics basics; L25-26 – Finite Volume Method for calculating incompressible steady-state flow; L27-28 – Compressible and transient flows calculations; L29-30 – Thermomechanics of fluids
Conditions ofcompletion	The condition for passing the course is passing the examination from the lecture and practice part. All the organization details and evaluation principles are consistent with, and other relevant issues not mentioned in the present document are regulated by, Regulations of studies at the Warsaw University of Technology.
Teacher	Prof. Dr. Krzysztof J. Wołosz