

## Information sheet for the course Fluid mechanics

<b>University:</b> Alexander Dubček University of Trenčín	
<b>Faculty:</b> <i>Faculty of special technology</i>	
<b>Course unit code:</b> <i>ŠST/B/4-35/d</i>	<b>Course unit title:</b> <i>Fluid mechanics</i>
<b>Type of course unit:</b> <i>compulsory</i>	
<b>Planned types, learning activities and teaching methods:</b> <i>2 lecture hours and 2 hour seminars per week</i>	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> <i>4<sup>st</sup> semester in the 2<sup>st</sup> year of study /full-time / 5<sup>st</sup> semester in the 2<sup>st</sup> year of study /part-time /</i>	
<b>Degree of study:</b> <i>I.</i>	
<b>Course prerequisites:</b> <i>none</i>	
<b>Assessment methods:</b> <i>Continuous assessment: 100% attendance and active creative work on exercises meet the goals set exercises, mastery of technical terminology, min. 60% attendance at lectures, semester work properly. The ongoing evaluation is necessary to obtain min. 25 points out of a total of 50 points. Final assessment: test in a written test with emphasis on theoretical knowledge of the subject and the support of the oral response, which is verified mastering nature of physical phenomena, laws of conservation of mass, momentum, conservation of energy in fluid flow to various examples. Defend and explain the test questions and examples with additional queries. Point-rated evaluation criteria: (E) ≥ 56 points, (D) ≥ 67 points (C) ≥ 77 points (B) ≥ 87 points (A) ≥ 95 points.</i>	
<b>Learning outcomes of the course unit:</b> <i>The student will acquire a comprehensive overview of the basic fluid flow in technical equipment, the lines, hydraulic and pneumatic components and technical equipment, determining speed, flow, pressure, and their forceful application. It will allow him to address the role of steady and unsteady fluid flow, flow around bodies, turbulent flow, water hammer effect on power washed around bodies, lift and drag bodies, acquire basic principles for hydrostatic, hydrodynamic pneumostatic and machinery. The list of basic experimental methods in the field of fluid mechanics.</i>	
<b>Course contents:</b> <i>Properties of fluids. Ideally, Newtonian and non-Newtonian fluid. Pascal's Law. Euler equations of equilibrium, relative calm fluid forces on bodies, Archimedes, the stability of vessels. Kinematics of fluid nozzle, tube current. Continuity equation, the general movement of fluids, whirling fluid movement, circulation rate. Fluid dynamics, Euler equations of hydrodynamics. Bernoulli equation. Navier-Stokes equation. Types of flow, hydraulic losses. Turbulent flow in a circular pipe. Hydrodynamics current tube: Continuity equation. Impulse and momentum equations. Fluid flow in technical devices in a simple and composite pipes. Calculation of the flow pipe. The effluent liquid from the vessel. The power of the free stream. Unsteady flow. Rotating channel. Water hammer in pipes. Loading and discharge of containers, balancing levels in the United containers. Laminar flow: Simple potential flow, spring and fall, the potential vortex. Dipole. Wrap bodies liquid Effect of current flows through the barrier and profile. The effect of current on bodies washed around. Frictional resistance and shape. Generation of Lift. Wrap aerodynamic bodies. Experimental methods in fluid mechanics. The types of hydraulic machines.</i>	
<b>Recommended of required reading:</b> <i>TARABA, B. a kol.: Mechanika tekutín. Termomechanika. Bratislava, STU 2004. ISBN 80-227-1265-5. TARABA, B. a kol.: Mechanika tekutín. Termomechanika. Zbierka príkladov. STU, Bratislava 2004. ISBN 85-254-1729-0. ŠEBESTA S.: Hydromechanika. bratislava, ES SVŠT 1978.</i>	

*GANČO, M.: Hydromechanika. SVŠT, Bratislava 1990.*  
*GANČO, M. a kol.: Hydromechanika, zbierka príkladov. SVŠT, Bratislava 1982.*  
*VARCHOLA, M.: Mechanika tekutín, príklady. STU, Bratislava 1993.*  
*SÚKUP, J.: Mechanika tekutín. , Alfa Bratislava 1983*  
*SÚKUP, J., MARTINKO, J.: Príklady z hydromechaniky. ES ŽU, Žilina 1997. ISBN 80-7100-395-6.*

**Language:** *Slovak*

**Remarks:**

*The subject is provided in the summer semester in the second year of full-time study. Compulsory subject.*

**Evaluation history**

*Total number of students being evaluated: 292*

A	B	C	D	E	FX
38.22	9.59	18.15	25.00	4.59	4.45

**Lecturers:** *Assoc.prof. Ing. Vladimír Áč, CSc. - lecturer*  
*Ing. Lenka Rybičková, PhD. - assistant instructor*  
*Ing. Beáta Kopoláková, PhD. - assistant instructor*

**Last modification:** *15.4.2014*

**Supervisor:** *prof. Ing. Jiří Balla, CSc., guarantee of the study program "Special Mechanical Engineering Technology".*