

**Information sheet for the course**  
**Hydraulic and pneumatic components and circuits**

<b>University:</b> <i>Alexander Dubček University of Trenčín</i>	
<b>Faculty:</b> <i>Faculty of special technology</i>	
<b>Course unit code:</b> <i>ŠST/I/4-38/d</i>	<b>Course unit title:</b> <i>Hydraulic and pneumatic components and circuits</i>
<b>Type of course unit:</b> <i>compulsory</i>	
<b>Planned types, learning activities and teaching methods:</b> <i>2 lecture hours and 1 lab hour per week</i>	
<b>Number of credits:</b> <i>4</i>	
<b>Recommended semester:</b> <i>1<sup>st</sup> semester in the 1<sup>st</sup> year (full-time)</i> <i>1<sup>st</sup> semester in the 1<sup>st</sup> year (part-time)</i>	
<b>Degree of study:</b> <i>II. (engineer)</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, properly Term laboratory work. 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 activities and calculation of hydraulic and pneumatic mechanisms on different 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>Student will complete a basic overview of the purpose, structures and principles of hydrodynamic, hydrostatic and pneumatic components and circuits. Basic calculations, principles of design, selection and assembly of hydraulic and pneumatic systems using drawing programs. List with experimental methods of determining the essential characteristics of components and systems for teaching facilities.</i>	
<b>Course contents:</b> <i>Energy and information transfer in hydraulic and pneumatic components and systems. Drawing of hydraulic and pneumatic components and circuits. Hydrostatic, hydrodynamic mechanisms and mechanisms of alternating fluid flow. Power converters, baffling elements of flow, pressure, characteristics, structure, calculation of basic parameters, selection principles and calculation circuits for applications. The use of proportional elements, switchgear, pressure valves, filtration, design tanks, pipelines, batteries, radiators. The use of hydrostatic circuits with direct fluid flow, management, blocking and braking movements. Using the position, speed and power of servomechanisms. The use of pneumatic mechanisms, management and auxiliary elements. Basic pneumatic circuits and systems of mobile technology. Accessories for pneumatic circuits. Hydraulic and pneumatic systems, directional control vehicles, cooling and braking systems. Experiments with selected basic elements and circuits.</i>	
<b>Recommended of required reading:</b> [1] PIVOŇKA, J. a kol.: <i>Tekutinové mechanismy</i> . Praha, SNTL 1987. [2] PACIGA, A. - IVANTYŠYN, J.: <i>Tekutinové mechanizmy</i> . Bratislava/Praha, ALFA/SNTL 1985. [3] ŠEBESTA, S. - TURZA, J.: <i>Teória tekutinových mechanizmov</i> . Bratislava, ES SVŠT 1989. [4] KOPÁČEK, J.: <i>Pneumatické mechanizmy. Pneumatické prvky a systémy</i> . Skriptum. Ostrava: VŠB-TU Ostrava, 1996. 267 s. [5] ŠEBESTA, S., TURZA, J.: <i>Teória tekutinových mechanizmov</i> . Bratislava, ES SVŠT 1989. ISBN 80-227-0120-3. [6] TURZA, J., PETRANSKÝ, I., JURČO, I., TKÁČ, Z.: <i>Dvojfázové hydraulické</i>	

*mechanizmy so striedavým prietokom kvapaliny. Vedecká monografia. Trenčín: Vydala Trenčianska univerzita AD v Trenčíne 2005. 242 s. ISBN 80-8075-071-8. 242 s.*

[7] TURZA, J.: *Dynamika tekutinových systémov. Žilina, ES VŠDS 1994. ISBN 80-7100-162-7.*

[8] TURZA, Jozef: *Axiálne piestové hydrostatické prevodníky: Teória a výpočet. - Trenčín: TNUAD, 2009. - 101s - ISBN 978-80-8075-436-5 - 10*

[9] CERHA, J.: *Hydraulické a pneumatické mechanizmy I. Liberec, FS TU v Liberci 2006. ISBN 80-7372-067-1.*

[10] BAROŠKA, J. *Hydrostatické mechanizmy. Martin, HYDAC 2012, ISBN 978-80-970 897-2-6.*

**Language:** *Slovak*

**Remarks:**

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

**Evaluation history:**

*Total number of students being evaluated: 342*

A	B	C	D	E	FX
18.42	30.12	25.73	19.99	14.91	0.0

**Lecturers:** *prof. Ing. Jozef Turza, CSc. - lecturer*  
*Ing. Beáta Kopiláková, PhD. - assistant instructor*  
*Ing. Ludmila Šimonáková, PhD. - assistant instructor*

**Last modification:** *15.4.2014*

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