

## Information sheet for the course Control systems I

<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>MŠT/B/1-24/d</i>			<b>Course unit title:</b> <i>Control systems I</i>		
<b>Type of course unit:</b> <i>compulsory</i>					
<b>Planned types, learning activities and teaching methods:</b> <i>2 hours of lectures per week, 2 hours of exercises per week, face to face method</i>					
<b>Number of credits:</b> 7					
<b>Recommended semester:</b> <i>5<sup>th</sup> semester in the 3<sup>rd</sup> year (full-time)</i> <i>5<sup>th</sup> semester in the 3<sup>rd</sup> year (part-time)</i>					
<b>Degree of study:</b> <i>I. (bachelor)</i>					
<b>Course prerequisites:</b> <i>MŠT/B/4-01/d Matematika I, MŠT/B/4-02/d Matematika II, MŠT/B/4-07/d Fyzika I, MŠT/B/1-81/d Základy elektrotechniky a elektroniky</i>					
<b>Assessment methods:</b> <i>100% participation in exercises, meet the goals set exercises, min. 60% attendance at lectures, correctly semester work, demonstrate knowledge of subject course in written and oral examination.</i>					
<b>Learning outcomes of the course unit:</b> <i>The student will obtain a comprehensive overview and basic understanding of modeling, analysis and design of linear feedback control systems. Students will learn how to model the mechanical, electrical and electromechanical systems such as differential equations and transfer functions. The analysis covers the stability of the open and closed loop time response and frequency response systems. Design methods include PID controller design. Students will also learn how to apply theory to real engineering problems with MATLAB. Students acquire basic knowledge for more advanced courses of the control systems.</i>					
<b>Course contents:</b> <i>Characterization and classification of automation. Logic control, logical functions, Boolean algebra, logic control circuits, programmable logic controllers. Laplace transformation. Static and dynamic properties of the control elements. Differential equations of system and transfer function. Impulse response. Step response. Frequency response. Traffic delays. Block diagrams. Controllers - foundations, properties, methods of design, use. Stability of control loops. The stability criteria. Discrete control circuit. Z-transformation. Difference equations. Description discrete control elements. Digital controllers. Stability of discrete circuits.</i>					
<b>Recommended of required reading:</b> <i>BALÁTEĚ, J.: Automatické řízení. Vyd. BEN Praha 2004, ISBN 978-80-7300-355-5, ISBN 80-7300-148-9</i> <i>ŠVARC, I.: Základy automatizace, Brno FS VUT, 2002.102 s.</i> <i>ROUBAL, J.: Regulační technika v příkladech. Vyd. BEN Praha 2011, 276 s. ISBN 978-80-7300-260-2</i>					
<b>Language:</b> <i>Slovak, English</i>					
<b>Remarks:</b>					
<b>Evaluation:</b> <i>Total number of students being evaluated 29 divided by notes</i>					
A	B	C	D	E	FX
3,6	0	3,6	14,6	30,9	47,3
<b>Lecturers:</b> <i>Assoc.prof. Ing. Lubomír Uherík, CSc., Ing. Milan Jus, PhD.</i>					

**Last modification:** 15.4.2014

**Supervisor:** *Assoc. prof. Ing. Peter Lipták, CSc., guarantee of the study program „Mechanisms in Special Technology“*