

Study program: Electrical and Computing Engineering, Mechatronics				
Type and level of studies: Master studies (second level of studies)				
Course unit: Industrial Communication Networks				
Teacher in charge: Uroš Pešović				
Language of instruction: English				
ECTS: 6				
Prerequisites: -				
Semester: Winter				
<i>Course unit objective:</i> The aim of the course is to familiarize the student with a set of communication networks and protocols used in industry. Also, the goal is to familiarize the student with the characteristics of communication media, network topologies and application frameworks of different types of communication networks in industry.				
<i>Learning outcomes of Course unit</i> After passing the exam in this subject, the student is expected to be able to know industrial communication networks and protocols and to be able to apply them in specific industrial applications.				
Course unit contents <i>Theoretical teaching</i> 1. Fundamentals of digital communications (the roles of devices in the network, network topologies, communication media, channel capacity, layered protocol architecture, ISO/OSI reference model) 2. Low-level communication protocols (synchronous and asynchronous transmission, coding, RS 232, RS485, CAN, Asi, HART) 3. Medium-level communication protocols (Modbus, Profibus, , CanOpen and DeviceNet). 4. High-level communication networks (Industrial Ethernet, communication protocols Profinet and Modnet). 5. Wireless industrial communication networks (IEEE 802.11, IEEE 802.15.4 and GSM networks) 6. SCADA systems (concept, components and functions of SCADA systems) <i>Practical teaching</i> During the exercises, students are introduced to the configuration and use of industrial communication networks covered in theory classes.				
Literature [1] S. Mackay, E. Wright, D. Reynders, J. Park, Practical Industrial Data Networks: Design, Installation and Troubleshooting, Newnes An imprint of Elsevier, 2004, ISBN 07506 5807X [2] D. Bailey, E. Wright, Practical SCADA for Industry, Newnes, An imprint of Elsevier, 2003, ISBN 07506 58053 [3] W. Stallings, „Data and Computer Communications“, Prentice Hall, 2009, ISBN 0-13-084788-7				
Number of active teaching hours				Other classes
Lectures: 2	Practice:2	Other forms of classes:	Independent work:	
Teaching methods: consultations, independent work				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam	No. of points:	
Student’s activity during lectures	0	oral examination	0	
Practical classes	20	written examination	50	
Seminars/homework	0			
Project	30			
Grading system				
Grade	No. of points	Description		
10	91-100	Excellent		
9	81-90	Exceptionally good		
8	71-80	Very good		
7	61-70	Good		
6	51-60	Passing		
5	less than 50	Failing		