

Study program: Master in Mechatronics				
Type and level of studies: Master studies (second level of studies)				
Course unit: Industrial Communication Networks				
Teacher in charge: Djukic R. Slobodan				
Language of instruction: English				
ECTS: 6				
Prerequisites: None				
Semester: Winter				
Course unit objective				
Course goal is to introduce to students set of communication networks and protocols used in industry. Students are introduced to practical issues related to the usage of industrial communication networks, such as basic properties, topologies and field of their use.				
Learning outcomes of Course unit				
Upon successful completion of the course, students are qualified to apply the acquired knowledge on industrial communication networks and protocols in real industrial applications.				
Course unit contents				
<i>Theoretical classes</i>				
1. Basics of digital communications (Digital modulations, Channel Capacity, ISO/OSI reference model)				
2. Low-level communication networks (properties and topology of AS-Interface networks)				
3. Mid-level communication networks (properties and topology of RS485 and CAN networks, Profibus, Modbus, CanOpen and DeviceNet communication protocols)				
4. High-level communication networks (properties and topology of Industrial Ethernet networks, ProfiNet and ModNet communication protocols)				
5. Radio Identification (RFID) systems (active and passive RFID systems)				
6. Wireless communication networks (properties and topology of IEEE 802.11, IEEE 802.15.4 and GSM networks)				
<i>Practical classes</i>				
Lab and computer sessions, case study				
Literature				
1. PRACTICAL INDUSTRIAL DATA NETWORKS: DESIGN, INSTALLATION AND TROUBLESHOOTING, Steve Mackay, Edwin Wright, Deon Reynders, John Park, Amsterdam ; Oxford : Newnes, 2004, ISBN: 978-0-7506-5807-2				
2. DATA AND COMPUTER COMMUNICATIONS, William Stallings, Prentice Hall, 2009,ISBN 0-13-084788-7				
Number of active teaching hours				Other classes
Lectures: 2	<i>Practice:</i> 2	<i>Other forms of classes:</i> Mentoring system	<i>Independent work:</i> Case study	
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	10	oral examination	40	
Practical classes	10	written examination	0	
Seminars/homework	20			
Project	20			
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		