

RTU Course "Industrial Communication Networks"

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General data

Code	EEI501
Course title	Industrial Communication Networks
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Leonīds Ribickis
Academic staff	Aivars Pumpurs
Volume of the course: parts and credits points	1 part, 4.5 credits
Language of instruction	LV, EN
Annotation	Basic notion of industrial communication networks, their architecture and features of utilization in robotic systems and autonomous electric devices. Basic elements of wire and wireless networks. OSI model. Interface equipment and communication protocols. Architecture of intelligent communication networks. Connection of typical automatic elements in control scheme. Analysis of industrial networks models. Computer control of robotic industrial processes.
Goals and objectives of the course in terms of competences and skills	The students will get the skills to define industrial communication networks in stationary and mobile robotic systems, analyze operation of communication networks and synthesize new industrial communication networks.
Structure and tasks of independent studies	The students are required to complete 2 laboratory works totally 16 academic hours. Before each laboratory work they are expected to summarize the theoretical basics of the question. After the work a report should be completed and the laboratory work should be defended.
Recommended literature	1. L. Ribickis, N. Kuņicina, J. Čaik. Industriālo tīklu pamati, RTU, Rīga, 2007., 48 lpp. 2. R. Rutkauskas, V. Mačerauskas, Network for building and industry automation, Kaunas Tehnologija, 2004., 385 p. 3. M. Ercegovic, T. Lang, J. H. Moreno. Introduction to Digital Systems. John Wiley & Sons, Int., 1999., 498 p.
Course prerequisites	General knowledge in computer science. EEI211 Computer science(special course in industrial electronics)

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Main principles of industrial communication networks architecture.	4	0	0	0
Architecture of communication networks and utilization features in robotic systems.	4	0	0	0
Basic elements of wire and wireless communication networks, OSI model.	4	0	0	0
Interface devices and communication protocols in robotic systems.	4	0	0	0
Principles of intelligent communication networks architecture.	4	0	0	0
Informative connection of typical automation elements in control systems.	4	0	0	0
Analysis of industrial communication networks models.	4	0	0	0
Communication computer control systems of robotic manufacture and transport processes.	4	0	0	0
1. Lab.w. Basic elements of industrial communication networks.	8	0	0	0
2. Lab. w. Architecture of industrial computer networks, direct joint of devices.	8	0	0	0
Total:	48	0	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
The students are able to distinguish elements of communication and computer networks, describe main principles of industrial communication networks architecture.	Completed, processed, formed, defended 1st lab.work. Assessment. Passed an exam
The students are able to realize in practice the connection of industrial computer network elements and testing of network operation.	Completed, processed, formed, defended 1st lab.work. Assessment. Passed an exam
The students are able to realize connection of two network elements and make an analysis of the communication network operation.	Completed, processed, formed, defended 2nd lab.work. Assessment. Passed an exam
The students are able to synthesize a new connection and examine its work by means of industrial communication network model. They should be able to evaluate the correspondence of the connection.	Completed, processed, formed, defended 2nd lab.work. Assessment. Passed an exam

Study subject structure

Part	CP	Hours			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	4.5	2.0	0.0	1.0		*	