

Integration of measurement and control systems - course description

General information	
Course name	Integration of measurement and control systems
Course ID	06.2-WE-ELEKTD-IofMandCS-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Electrical Engineering
Education profile	academic
Level of studies	Second-cycle Erasmus programme
Beginning semester	winter term 2017/2018

Course information	
Semester	2
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">dr inż. Robert Szulim

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Exam
Laboratory	30	2	-	-	Credit with grade

Aim of the course

Teaching the principles and mastering of the ability to create and run software using serial interfaces, networks, database systems and selected elements of Internet technologies in the tasks of integration of measurement and control systems.

Prerequisites

Programming Languages I i II

Scope

Primary goals of integration of control measurement systems. Programming languages and tools used in the task of integrating control measurement systems. Microsoft .NET platform. Fundamentals of programming in C #.

The use of serial communication interfaces. Principles of building software using serial interfaces. Problems of establishing and maintaining communication, blocking in anticipation of data and handling of errors.

The use of TCP/IP protocol. ISO OSI and TCP/IP communication models and their practical significance in network communication tasks. Use of TCP and UDP protocols, establishing and maintaining a connection, issues of ensuring communication reliability. Application models using TCP/IP.

The use of database systems. Basic rules for creating database objects like tables, indexes, keys, and relationships. SQL basics. Programmatic implementation of communication with the database system.

Selected Internet Technologies. Protocols and services World Wide Web, FTP and E-mail. Use of Internet services with control measurement systems.

Fundamentals of concurrent processing. Threading, thread creation and retention, resource sharing between threads, basic access synchronization methods for shared resources.

The use of built-in systems for integration of control measurement systems Construction of embedded systems using Windows CE and Linux operating systems. The problems of launching this type of systems together with the software prepared for the integration of control measurement systems.

Teaching methods

lecture: conventional lecture, discussion

laboratory: work in the groups, practical excersises

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to design and write a program that implements communication procedures using serial and network interfaces		<ul style="list-style-type: none">an ongoing monitoring during classescarrying out laboratory reports	<ul style="list-style-type: none">Laboratory

Outcome description	Outcome symbols	Methods of verification	The class form
It is capable of building and running a web portal compatible with the database		<ul style="list-style-type: none"> an ongoing monitoring during classes carrying out laboratory reports 	<ul style="list-style-type: none"> Laboratory
Can manage WWW server and FTP server		<ul style="list-style-type: none"> an ongoing monitoring during classes carrying out laboratory reports 	<ul style="list-style-type: none"> Laboratory
Student knows the basic methods of programmatic integration of control measurement systems using serial and network communication interfaces, databases, concurrent processing and selected Internet technologies.		<ul style="list-style-type: none"> an examination test with score scale 	<ul style="list-style-type: none"> Lecture

Assignment conditions

Lecture - passing condition is obtaining positive grade from the exam

Laboratory - passing condition is obtaining positive grades from all laboratory excersises planned to realisation according to laboratory programm

Final grade components = lecture 50% + laboratory 50%

Recommended reading

1. Smet B., C# Unleashed, Pearson Publishing, 2013
2. Practical .NET 2.0 Networking Projects, Lee, W., APress, 2007
3. Multithreading in C# 5.0 Cookbook, Agafonov E., Packt, 2013

Further reading

1. Axelson J., Serial Port Complete: The Developer's Guide, LakeView Research, 2007
2. Randolph N., Gardner D., Professional Visual Studio 2008, Wiley, 2008.

Notes

Modified by dr inż. Robert Szulim (last modification: 05-04-2017 14:06)

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