Software for measurement and control equipment - opis przedmiotu

Informacje ogólne

Nazwa przedmiotu	Software for measurement and control equipment
Kod przedmiotu	11.3-WE-INFP-SoMaCE-Er
Wydział	Wydział Nauk Inżynieryjno-Technicznych
Kierunek	Informatyka
Profil	ogólnoakademicki
Rodzaj studiów	Program Erasmus
Semestr rozpoczęcia	semestr zimowy 2017/2018

Informacje o przedmiocie

Semestr	6
Liczba punktów ECTS do zdobycia	4
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	• dr inż. Leszek Furmankiewicz

Formy zajęć

Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	15	1	-	-	Zaliczenie na ocenę
Laboratorium	30	2	-	-	Zaliczenie na ocenę

Cel przedmiotu

To provide knowledge about organization of measurement systems and measurement and control systems.

To provide knowledge about structures, principles of work and properties of measurement system elements.

Forming the design skills of communication and visualization software for measurement systems and measurement and control systems

Wymagania wstępne

Principles of programming, experiment methodology, computer network, internet applications

otu-szczegowetrecimerytoryczne>To provide knowledge about structures, principles of work and properties of measurement system elements.

Forming the design skills of communication and visualization software for measurement systems and measurement and control systems

Zakres tematyczny

Measurement and control systems - introduction. Classification of measuring systems. Structure and organization of measuring and control systems. Algorithm of measuring system. Selection of programming language and computer aided design tools.

Data transmission standards in measuring systems. Definition and classification of the interface. Interfaces used in measuring systems. Serial interfaces: RS - 232, RS - 422, RS - 485, Serial interface programming. Parallel interface IEEE 488: principal tags of IEEE 488 standard, bus of the interface, state of work reporting. IEEE 488.2 standard. IEEE 488.2 controller programming and IEEE 488.2 driver functions.

Data acquisition systems. Classification and basic functional blocks of the data acquisition systems. Data acquisition systems programming, description of the software functions.

SCPI standard. SCPI device model, structure of commands, trigger system, status system. Profile of commands for example devices.

Software development environments for measuring and control systems programming. Software development environments: LabWindows, LabView, Keysight Vee. VISA I/O library. Software drivers VXIplug&play. IVI drivers.

Virtual measurement instruments. The definition, structure and basic tags of virtual instruments. Virtual instruments programming. Examples of virtual instruments.

Programmable Automation Controllers (PAC). PAC in measuring and control systems as an example of B&R systems. Hardware and software architecture of PAC. Automation Studio - integrated software development environment. Process visualization in PAC.

Internet technologies in measurement and control systems. Embedded WWW servers. Hardware and software profiles of chosen embedded WWW servers.

Metody kształcenia

Lecture, laboratory exercises.

Efekty uczenia się i metody weryfikacji osiągania efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
Can design communication software for measurement systems based on fundamental communication interfaces		• obserwacje i ocena umiejętności praktycznych studenta	• Laboratorium
Can design visualization software for measurement systems with the application of dedicated programming environments		• obserwacje i ocena umiejętności praktycznych studenta	• Laboratorium
Can select measurement systems programming tools		• kolokwium	• Wykład
Understands organization principles of measurement systems and operation principles of measurement systems elements		• kolokwium	• Wykład

Warunki zaliczenia

Lecture – the passing condition is to obtain a positive mark from the final test.

Laboratory – the passing condition is to obtain positive marks from all laboratory exercises to be planned during the semester.

Literatura podstawowa

1. Winiecki W.: *The Organization of Computer Measuring Systems*. Warsaw University of Technology Press, Warsaw, 1997 (in Polish)
2. Mielczarek W.: *Measuring Instruments and Systems with SCPI Compatibility*, Helion, Gliwice 1999 (in Polish)
3. Lesiak P., Świsulski D.: *Computer Measuring Technique in Examples*, PAK, Warsaw, 2002 (in Polish)
4. Nawrocki W.: *Computer Measuring Systems*, WKiŁ, Warsaw, 2002 (in Polish)
5. Rak R., J.: *Virtual Measuring Instrument - Real Tool of Present Metrology,* Warsaw University of Technology Press, Warsaw, 2003 (in Polish)
6. Nawrocki W.: *Distributed Measuring Systems*, WKŁ, Warsaw 2006 (in Polish)
7. Bentley J. P.: *Principles of Measurement Systems*, Pearson Education Limited, Harlow, England, 2005
8. Caristi A., J.: *IEEE-488 General Purpose Instrumentation Bus Manual,* Academic Press, INC., San Diego, California, 1992
9. Johnson G.W., Jennings R.: *LabView Graphical Programming*, MacGraw-Hill, New York, 2006

Literatura uzupełniająca

Uwagi

Zmodyfikowane przez dr inż. Leszek Furmankiewicz (ostatnia modyfikacja: 08-05-2017 12:27)

Wygenerowano automatycznie z systemu SylabUZ