

DESCRIPTION OF THE COURSES

- Course code: ARR3308
- Course title: COMPUTER MANAGING OF MEASURING SYSTEMS
- Language of the lecturer: polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	1		1		
<i>Number of hours/semester*</i>	15		15		
<i>Form of the course completion</i>					
<i>ECTS credits</i>	1		1		
Total Student's Workload	60				

- Level of the course (basic/advanced):
- Prerequisites: Fundamentals of electronic, electrical measurement
- Name, first name and degree of the lecturer/supervisor: Wojciech Grotowski, PhD
- Names, first names and degrees of the team's members: Grzegorz Kosobudzki PhD
- Year:..... Semester: II , 2stage
- Type of the course (obligatory/optional):
- Aims of the course (effects of the course): knowledge of using and programming interfaces which are used in microcontroller systems and measurement systems
- Form of the teaching (traditional/e-learning):
- Course description: Computer as the controller of a measuring system (MS) – classification of measuring systems, functional scheme of a measuring system. Structure and organization of measuring systems, technical realisation, steering blocks, measuring sensors, blocks of acquisition and data transformation, interfaces. Software of measuring systems – integrated programme surroundings. Principles action of measuring graphic interfaces: LabVIEW, Lab Windows, HP Benchlink, Agilent VEE. Designing of measuring systems
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Metrology to computer elementary measuring systems, elementary functions. Structure and organization of measuring systems	2
2. Interfaces in measuring systems. Measuring systems with serial interfaces (RS-232, RS-485, RS-422, USB, IEEE1394)	2
3. Measuring systems with the parallel interface IEEE-488	2
4. The VXI and PXI standards in realization of measuring systems	2
5. Measuring system software– integrated programme surroundings; principles of functioning of LabVIEW, HP Benchlink, Agilent VEE	2
graphic interfaces. Measuring system designing and running with application of the HP VEE surrounding	2
6. Examples of programming measuring systems (SCPI, VISA)	2
7. Data acquisition board – structure and programming.	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents: Practical realisation of exemplary computer – controlled measuring systems with application of the integrated AgilentVEE programme surrounding, GPIB (IEEE488) interfaces and measuring instruments (multimeter, generator, power supply, oscilloscope) . Contents of the laboratory correlate with the stages of designing programming of measuring systems; gathering, processing and visualization of measurement data. Programming data acquisition board use LabView. Completion is based on realisation of a given measuring system design..
- Project – the contents:
- Basic literature:
 1. Winiecki W., Organizacja komputerowych systemów pomiarowych, Oficyna wydawnicza Politechniki Warszawskiej, Warszawa 1997.
 2. Wojciech Mielczarek - Urządzenia pomiarowe i systemy kompatybilne ze standardem SCPI – Helion 1999
 3. Waldemar Nawrocki - Rozproszone systemy pomiarowe- WKŁ 2006
 4. Dariusz Świsulski - Komputerowa technika pomiarowa. Oprogramowanie wirtualnych przyrządów pomiarowych w LabVIEW – PAK 2005
 5. Dariusz Świsulski - Komputerowa technika pomiarowa w przykładach – PAK 2002
 6. Tłaczała Wiesław: Środowisko LabVIEW w eksperymencie wspomaganym komputerowo. WNT, Warszawa 2002
- Additional literature:
 1. <http://www.scpiconsortium.org>; <http://www.vxi.org>; www.ni.com; www.agilent.com ; www.tektronix.com.
 2. Winiecki W., Nowak J., Stanik S.: Graficzne zintegrowane środowiska programowania do projektowania komputerowych systemów pomiarowo-kontrolnych. Wyd. Mikom, Warszawa 2001.
 3. Bogusz Jacek.: Lokalne interfejsy szeregowo w systemach cyfrowych – Wydawnictwo BTC, Warszawa 2004
 4. Mielczarek W. Szeregowo interfejsy cyfrowe, Helion, Gliwice
- Conditions of the course acceptance/creditation:
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* - depending on a system of studies