

DESCRIPTION OF THE COURSES

- Course code: ELR3308
- 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 | | 2 | | |
| <i>Number of hours/semester*</i> | 15 | | 30 | | |
| <i>Form of the course completion</i> | pass | | pass | | |
| <i>ECTS credits</i> | | | | | |
| <i>Total Student's Workload</i> | | | | | |

- Level of the course (~~basic~~/advanced):
- Prerequisites: Fundaments 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 analog and digital measurement systems
- Form of the teaching (traditional/~~e-learning~~): umiejętność projektowania, programowania i użytkowania komputerowych systemów pomiarowych
- 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 graphic interfaces. Measuring system designing and running with application of the HP VEE surrounding | 2 |
| 6. Examples of programming measuring systems (SCPI, VISA) | 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

* - depending on a system of studies