



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Sterowanie aparaturą badawczą [S2ETI2>SAB]

Course

Field of study

Education in Technology and Informatics

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

15

Number of credit points

3,00

Coordinators

dr inż. Adam Buczek prof. PP
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Lecturers

Prerequisites

1. Basic knowledge concerning electronics and informatics. 2. Ability to work with computer and acquire information from given sources. 3. Understanding of necessity of own competence broadening, responsibility for created technical solutions.

Course objective

1. Hand over knowledge concerning electronics and informatics solutions for controlling of research apparatus. 2. Develop students abilities to create functional control systems based on modern hardware and software solutions. 3. Mold students responsibility for created control systems.

Course-related learning outcomes

Knowledge:

Solutions in scope of electronic and informatics devices useful in cooperation with research apparatus
Applications of research and measurement equipment as well as actuators and systems

Skills:

Using modern technical and informatic solutions in controlling of research apparatus

Designing simple systems using research equipment and appropriate tools and actuators

Social competences:

Understanding of necessity of systematic own engineering knowledge broadening and responsibility for created systems.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Assessment criteria/assessment: in accordance with the study regulations

Evaluation of activity and work on project:

Student works strongly supported by teacher, with understanding of acquired knowledge. Is able to solve assigned tasks only in common way. Is not capable to analyze more problems than covered by basic scope of teaching. Demonstrate limited engagement during lessons. (3)

Student works independently, occasionally supported by teacher, with understanding of acquired knowledge. Is able to solve assigned tasks in proper way. Sometimes is capable to analyze more problems than covered by basic scope of teaching. Demonstrate engagement during lessons. (4)

Student works fully independently with deep understanding of acquired knowledge. Is able to solve assigned tasks in ingenious and unconventional way. Is capable to analyze more problems than covered by basic scope of teaching. Demonstrate great engagement during lessons. (5)

Programme content

Issues related to sources of knowledge about measurement and testing equipment and methods of its control and integration with computer systems. Digital control systems, such as modular, embedded, microcontroller, and real-time systems, are discussed, as well as methods of programming them using scripting languages, graphical languages, and the SCPI standard.

Course topics

1. Sources of knowledge in scope of research-measurement apparatus and methods of controlling one (e.g. books, professional magazines, documentations of producers e.t.c.),
2. Solutions in controlling of research apparatus and in integration of research apparatus with computer systems.
3. Digital systems useful in controlling of research apparatus:
 - Modular systems,
 - Embedded systems,
 - Systems with microcontroller,
 - Real Time systems,
4. Programming of systems for controlling of research apparatus:
 - Standard Commands for Programmable Instruments (SCPI),
 - Script programming languages,
 - Graphical programming languages,
5. Controlling of loads and actuators,
6. Practical examples of controlling of research apparatus,
7. Optimization of systems for controlling of research apparatus.

Teaching methods

Lecture: Multimedial presentation.

Project: Individual project work, discussion.

Bibliography

Basic:

1. K. Hejn, A. Leśniewski. Systemy pomiarowe. WPW, Warszawa 2017
2. R. Kwiecień. Komputerowe systemy automatyki przemysłowej. Helion, Gliwice 2013
3. J.Boxall, Arduino 65 praktycznych projektów, Helion, Warszawa 2013

Additional:

1. Magazine „Automatyka Podzespoły Aplikacje”, ISSN 1896-6381

2. Magazine „Elektronik”, ISSN 1248-4000
3. Magazine „Elektronika dla Wszystkich”, ISSN 1425-1608
4. Magazine "Elektronika Praktyczna", ISSN 1230-3526

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	32	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	43	1,50