POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Controlling of research apparatus

Course

Field of study	Year/Semester
Technical - Informatic Education	1/2
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
Second-cycle studies	polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15		
Tutorials	Projects/seminars	
	15	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Adam Buczek, prof. PP

adam.buczek@put.poznan.pl

Responsible for the course/lecturer:

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 soultions.

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.

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Course-related learning outcomes

Knowledge

W01. Solutions in scope of electronic and informatics devices useful in cooperation with research apparatus [K2_W03].

W02. Applications of research and measurement apparatus and actuators [K2_W06].

Skills

U01. Using modern technical and informatic solutions in controlling of research apparatus [K2_U11, K2_U19].

U02. Project of simple systems using research apparatus with sensors and actuators [K2_U09].

Social competences

K01. Understanding of necessity of systematic own engineering knowledge broadening and responsibility for created systems. [K2_K01, K2_K02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Effect:	Evaluation form:	Evaluation criteria:
W01, W02	Oral / written exam	50.1%-70.0% (3)
		70.1%-90.0% (4)
		from 90.1% (5)

U01, U02, K01   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

1. Sources of knowledge in scope of research-measurement apparatus and methods of controlling one (e.g. books, proffesional magazines, documentations of producers e.t.c.),

2. Solutions in controlling of research apparatus and in integration of research apparatus with computer systems.

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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

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Breakdown of average student's workload

	Hours	ECTS
Total workload	53	3,0
Classes requiring direct contact with the teacher	34	2,0
Student's own work (literature studies, preparation for tests/exam, project preparation) [1]	19	1,0

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[1] delete or add other activities as appropriate