STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Cooling Automatics		**1010611271010615314**
Field of study: **Transport**	Profile of study (general academic, practical): **(brak)**	Year /Semester: **4 / 7**
Elective path/specialty: **Food Transport**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **1** Classes: **1** Laboratory: **-** Project/seminars: **-**		No. of credits: **1**
Status of the course in the study program (Basic, major, other): **(brak)**	(university-wide, from another field): **(brak)**	
Education areas and fields of science and art		ECTS distribution (number and %)

Responsible for subject / lecturer:

dr inż. Tomasz Rochatka,
email: tomasz.rochatka@put.poznan.pl
tel. 665-2655,
MRiT
ul. Piotrowo 3, 60-695 Poznań

Responsible for subject / lecturer:

dr hab. inż. Arkadiusz Stachowiak
email: arkadiusz.stachowiak@put.poznan.pl
tel. 665-2655
MRiT
ul. Piotrowo 3, 60-695 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student knows methods for measurement of technological processes parameters and ways to automatic control over them.
2	**Skills**	Student is able to measure basic physical quantities
3	**Social competencies**	Student understands the need for continuous learning.

Assumptions and objectives of the course:

Study of new solutions for measuring equipment and computer control systems. Development of conceptual problem-solving skills for automation in the food industry.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has basic knowledge of measuring equipment for automatic control systems (temperature, pressure, flow, level). - [K1A_W16]
2. Student also knows about controllers, setting units and computer control systems. - [K1A_W16]
3. Student knows how selected process automation systems works. - [K1A_W16]

Skills:

1. Student can in a right way design automatic control system for cooling instalation in the storage chamber. - [K1A_U17]

Social competencies:

1. Student can think and act in an entrepreneurial manner. - [K1A_K05]

Assessment methods of study outcomes

Checking test.

Course description

Measuring equipment for automatic control systems - temperature, pressure, flow, level. Transmission and processing methods of the signal measurement. Recording equipment. Controllers and setting units. Computer control systems. Selected examples of process automation systems for the food industry (control of the cooling instalation in the storage chamber).

Basic bibliography:

1. Urbaniak A., Podstawy automatyki. Wydawnictwo Politechniki Poznańskie, Poznań 2001.
2. Piotrowski I., Okrętowe urządzenia chłodnicze. Wydawnictwo WSM w Gdyni, Gdynia 1994.
3. Kostro J., Elementy, urządzenia i układy automatyki. WSiP, Warszawa 1983.
4. Budny J., Zander Z., Pomiary i automatyzacja w przemyśle mleczarskim. WNT, Warszawa
5. Urbaniak A., Podstawy automatyki. Wydawnictwo Politechniki Poznańskie, Poznań 2001.
6. Piotrowski I., Okrętowe urządzenia chłodnicze. Wydawnictwo WSM w Gdyni, Gdynia 1994.
7. Kostro J., Elementy, urządzenia i układy automatyki. WSiP, Warszawa 1983.
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9. Urbaniak A., Podstawy automatyki. Wydawnictwo Politechniki Poznańskie, Poznań 2001.
10. Piotrowski I., Okrętowe urządzenia chłodnicze. Wydawnictwo WSM w Gdyni, Gdynia 1994.
11. Kostro J., Elementy, urządzenia i układy automatyki. WSiP, Warszawa 1983.
12. Budny J., Zander Z., Pomiary i automatyzacja w przemyśle mleczarskim. WNT, Warszawa

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Participation in lecture	15
2. Participation in classes	15
3. Preparedness to classes	1
4. Consultations	2
5. Preparedness to exam	2
6. Participation in passing exam	2

Student's workload

Source of workload	hours	ECTS
Total workload	37	1
Contact hours	34	1
Practical activities	0	0