



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Control in industrial processes [S1TOZ1>SwPP]

### Course

Field of study

Circular System Technologies

Year/Semester

3/5

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr inż. Sylwia Włodarczak

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### Lecturers

### Prerequisites

As a preliminary requirement the student should have basic knowledge of chemical and process engineering, electronics and electrical engineering, construction and operation principles of process apparatus. He should also be able to analyze the obtained measurement data in the field of chemical technology and engineering as well as to perform mathematical calculations.

### Course objective

Obtaining knowledge in the field of technological measurements, control and measuring apparatus in the chemical industry as well as elements of industrial automation and process control.

### Course-related learning outcomes

Knowledge:

1. knows the nomenclature, structure and principle of operation of measuring elements and automatic control systems related to process apparatus. k\_w20
2. has basic knowledge related to the selection of measurement and control devices used in circular systems technologies and related fields. k\_w21
3. he knows and describes the technological solutions and principles of operation of measuring and

control devices used in water treatment, wastewater and gas treatment. k\_w24

Skills:

1. has the ability to self-educate, is able to use source information in polish and a foreign language in accordance with the principles of ethics, and reads with understanding. k\_u04
2. correctly uses in discussions and correctly uses nomenclature and terminology in the field of industrial measurement and automation, closed-loop economy, chemistry, technology and chemical engineering, environmental protection and related disciplines, also in a foreign language. k\_u05
3. can read and perform simple block systems of automatic regulation. k\_u18

Social competences:

1. objectively assesses the level of their knowledge and skills, understands the importance of improving professional and personal competences adequately to changing social conditions and the progress of science. k\_k05

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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The knowledge acquired during the course is verified by passing a multiple-choice test. The test consists of 20-25 questions (closed). As part of the classes, students also prepare a multimedia presentation. It is allowed to carry out pass the test in a remote form depending on the epidemic situation. The pass threshold score is 51%.

### Programme content

Technological measurements, control and measuring apparatus in the chemical industry, elements of industrial automation and process control.

### Course topics

As part of the classes, the following are discussed:

- adjustment and executive elements,
- pneumatic, hydraulic and electric systems,
- control, signaling and blocking systems,
- measurement and control systems,
- static and dynamic properties of measurement systems,
- classification of automatic control systems,
- tasks of the automation of industrial processes,
- statistical analysis,
- reading and creating technological diagrams based on applicable standards,
- selection of the measuring and control devices for process installations,
- disturbances occurring during technological processes and methods of their elimination.

### Teaching methods

Multimedia presentation

### Bibliography

Basic

1. Piekarski M., Poniewski M.: Dynamika i sterowanie procesami wymiany ciepła i masy, WNT, Warszawa 1994.
2. Kostro J.: Elementy, urządzenia i układy automatyki, Wydawnictwa Szkolne i Pedagogiczne, Warszawa 2005.
3. Gawdzik A., Tabiś B., Figiel W., Zasady sterowania procesami technologii i inżynierii chemicznej. Politechnika Krakowska, Kraków 1991.

Additional

1. Ludwicki M., Sterowanie procesami w przemyśle spożywczym. PTTŻ Oddział Łódzki, Łódź 2002.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	38	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	37	1,50