COURSE DESCRIPTION CARD - SYLLABUS

Course name
Automation and industrial measurementses [S1IFar1>AiMP]

Course

Field of study
Pharmaceutical Engineering

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
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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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 and process 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. has knowledge in the field of automation and industrial metrology to the extent needed to formulate and solve simple computational tasks aimed at the selection of proper instrumentation and to perform experimental tests. k_w1
2. knows the basics of control and measurement systems and electronic control systems. k_w19.
3. has knowledge about the control of quantities and technological processes as well as metrology in

chemical technology and engineering as related fields directly connected with pharmaceutical engineering. k_w1
2. is able to plan and conduct simple experiments in the field of measurement and control, interpret their results and draw conclusions. k_u12

Skills:
1. use the understanding of the indicated sources of knowledge (list of basic literature) and acquire

Social competences:
1. understands the need for further training and improving their professional competences, systematically reports on laboratory exercises. k_k01
2. can interact and work in a group. k_k02

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: Exam in the form of a test (about 20 closed questions), additional presentation. The minimum passing grade/mark (acceptance pass mark) at the exam is 51%.
Laboratory: Test, Report on laboratory exercises, Oral and written answers

Programme content

The following topics are covered throughout the classes:
• Basic issues.
• Automatic regulation systems and regulators.
• Adjustment and executive elements.
• The role of executive systems in industrial control systems.
• Signaling, blockades and security.
• Measurements, measuring instruments and transducers.
• Control of quantities and technological processes in technology and chemical engineering as well as in the food industry as related fields directly connected with pharmaceutical engineering.
• Interactive calculators of aerosol deposition.
• Aerosol particle size measurements.
• Computer image analysis.

Teaching methods

Multimedia presentation, laboratory exercises.

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. Sosnowski T., Aerozole wziewne i inhalatory. Politechnika Warszawska, 2012 (https://repo.pw.edu.pl/docstore/download/WUT1fd2112638d74926bdd930663f4355b9/T.R.+Sosnowski+-+Aerozole+wziewne+i+inhalatory+%282012%29.pdf)
4. 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	60	3,00
Classes requiring direct contact with the teacher	40	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00