



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Metody kontroli procesu technologicznego (Methods of Technological Process Control)

Course

Field of study

Year/Semester

Technologia chemiczna (Chemical Technology)

IV/7

Area of study (specialization)

Profile of study

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Beata Strzemiecka

Responsible for the course/lecturer:

Prerequisites

Knowledge of physical chemistry, organic chemistry, basics of analytical chemistry, basics of chemical apparatus, mathematics

Course objective

Presentation of the principles of selection of control and measuring apparatus in industry, familiarizing students with the types of industrial analyzers and methods of their installation, familiarizing students with extended knowledge of chromatographic processes as a technique in the vast majority used to control technological processes, presentation of practical solutions of process analysis used in industry

Course-related learning outcomes

Knowledge

K_W06, P6S_WG, P6SI_WG - knows the necessary principles of operation of control and measurement systems and electronic control systems used in chemical technology

K_W07, P6S_WG, P6SI_WG - knows the rules of environmental protection related to chemical technology and waste management



K_W12, P6S_WG, P6SI_WG - knows the principles of construction, operation and selection of devices, reactors and apparatus used in chemical technology

Skills

K_U02, P6S_UK - can work both individually and as a team in a professional and other environment

K_U05, P6S_UU - has the ability to self-study

K_U06, P6S_UK - has language skills in the fields and disciplines relevant to chemical sciences and chemical technology, in accordance with the requirements specified for level B2 of the European Language Description System

K_U10, P6S_UW - has the preparation and competencies necessary to work in an industrial environment and knows the principles of occupational health and safety

K_U11, P6S_UW, P6SI_UW - is able to make a preliminary technical and economic analysis of engineering activities undertaken in chemical technology

K_U12, P6S_UW, P6S_UO - is able to conduct a critical analysis of the functioning method and assess existing technical solutions in technology and chemical engineering, in particular devices, apparatus, systems and processes

K_U14, P6S_UW, P6SI_UW - is able to assess the suitability of routine methods and techniques appropriate to solve practical engineering tasks in chemical technology, can also choose and apply the appropriate method and technique

K_U21, P6S_UW - selects analytical methods for qualitative and quantitative determination of chemical compounds

K_U25, P6S_UW, P6SI_UW - assess the risks associated with the use of chemical products and processes

K_U25, P6S_UW, P6SI_UW - assesses the risk associated with increasing the scale of chemical operations and processes

K_U26, P6S_UW - applies basic legal regulations and observes OHS rules related to the work performed

K_U29, P6S_UW, P6SI_UW - implements proper waste management through utilization and recycling

K_U32, P6S_UW, P6S_UO - selects analytical methods and techniques for process control and quality assessment of raw materials and products

Social competences

K_K01 - understands the need for further training and raising their professional, personal and social competences

K_K02, P6S_KO, P6S_KK - is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions made



K_K03, P6S_UO - can interact and work in a group, inspire and integrate engineering environments

K_K05, P6S_KR - correctly recognizes problems and makes the right choices related to the exercise of the profession, in accordance with the principles of professional ethics

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

written exam

Programme content

1. Process analysis - general types and principles of using process analyzers - extension and reminder of issues from the obligatory part of the subject.
2. Tasks of process analysis - extension and reminder of issues from the obligatory part of the subject.
3. Economic aspects of process analysis - extension and reminder of issues from the obligatory part of the subject.
4. System of sample collection and preparation for process analysis - extension and reminder of issues from the obligatory part of the subject.
5. Requirements for safe design and installation installation.
6. Methods of controlling the technological process.
7. Solutions used in process analysis (among others: backflushing, column switching in process gas and liquid chromatography, dilution and concentration of the liquid sample, cutting out the main component).
8. Examples of the use of chromatographic process analysis in the control of selected technological processes.
9. Legal regulations regarding process analysis.
10. Combined techniques.

Teaching methods

lecture, discussion

Bibliography

Basic

1. Process control, J. Hahn, DOI: 10.1002/0471238961.1618150307091522.a01.pub2 , 2003

Additional

1. The essence of chromatography, C.F. Poole, Elsevier, Amsterdam, 2003



Breakdown of average student's workload

	Hours	ECTS
Total workload	45	2,0
Classes requiring direct contact with the teacher	25	1,1
Student's own work (literature studies, preparation for tests/exam) ¹	20	0,9

¹ delete or add other activities as appropriate