COURSE DESCRIPTION CARD - SYLLABUS

Course name
Strategy of chemical production [S2TCh2-PTiB>SPC]

Course

Field of study
Chemical Technology

Year/Semester
1/2

Area of study (specialization)
Technological Processes and Bioprocesses

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student starting this subject should have a basic knowledge of technology and chemical engineering. He also has the necessary knowledge about both natural and synthetic raw materials, products and processes used in chemical technology, as well as development directions.

Course objective

The aim of the course is to present the challenges faced by the chemical industry and society resulting from the development and globalization of the chemical market. The main novelty in the chemical production strategy is the shift of emphasis to the approach assuming ensuring safety and sustainable development already at the design stage. This is an approach to ensure a non-toxic environment with a higher level of protection for human health and the environment, while strengthening the competitiveness of the EU chemical industry. This strategy is to ensure the phase-out of hazardous chemicals affecting vulnerable groups, unless they are considered essential for health, safety, the functioning of society or where there are no alternatives. This approach is also intended to stimulate innovation.

Course-related learning outcomes

Knowledge:

The student has knowledge of complex chemical processes, including the appropriate selection of materials, raw materials, methods, techniques, apparatus and equipment for carrying out chemical processes and characterizing the products obtained (K_W3).
The student has extensive knowledge of environmental problems related to the implementation of chemical processes (K_W8).
The student has knowledge of selected issues of modern chemical knowledge as well as aspects of copyright and industrial property (K_W14).

Skills:
The student has the ability to obtain and critically evaluate information from literature databases and other sources, and formulate opinions and reports on this basis (K_U1).
The student is able to design and conduct chemical reactions on a laboratory scale in various conditions and properly use the results of these tests to scale up (K_U9).
The student has the ability to adapt knowledge of chemistry and related fields to solve problems in the field of chemical technology and planning new industrial processes (K_U12).
The student is able to critically analyze industrial chemical processes and introduce modifications and improvements in this area, using the acquired knowledge, including knowledge about the latest achievements of science and technology (K_U15).
The student is able to critically assess the practical usefulness of using new achievements in chemical technology (K_U17).

Social competences:
The student is aware of the limitations of science and technology related to chemical technology, including environmental protection (K_K2).
The student understands the need to provide the public with information on the current state and directions of development of chemical technology, on the principles of use and handling of chemical products, about the risks associated with the acquisition of raw materials, chemical production and distribution (K_K7).

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified on the basis of the final written test. Passing threshold: 50% of points. Depending on the situation, two forms of the exam will be possible during the exam session: stationary and remote.

Programme content

Chemicals Strategy for Sustainable Development. Contamination Prevention Strategy. Designing safe chemicals. REACH regulation. Toxicity of chemicals in the environment and how we can prevent further chemical pollution in the future. Sustainable chemicals (solvents, cosmetics, pesticides, plastics, etc.). Innovative techniques in chemical production.

Teaching methods

Lecture: multimedia presentation.

Bibliography

Basic:
1. L. Synoradzki, J. Wisialski, Projektowanie procesów technologicznych, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006.
2. Red. A. Pyrża, Poradnik wynalazcy, UPRP, Warszawa 2009.
3. T. Paryjczak, A. Lewicki, M. Zaborski, Zielona chemia, Wydawnictwo PAN, Łódź 2005.
4. B. Burczyk, Zielona chemia. Zarys, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006.
5. Red. M. Stasiewicz, Technologia Chemiczna Organiczna, Wyd. Politechniki Poznańskiej, Poznań 2013.

Additional:
1. P. Wasserscheid, T. Welton, Ionic Liquids in Synthesis, Wiley-VCH, Weinheim 2003.
2. M. Mąkosza, M. Fedoryński, Phase transfer catalysis, in: Interfacial Catalysis ed. A.G. Volkov, New York, Marcel Dekker, 2003.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00