



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Strategy of chemical production

Course

Field of study

Year/Semester

Chemical Technology

I/I

Area of study (specialization)

Profile of study

Organic technology

general academic

Level of study

Course offered in

Second-cycle studies

Polish

Form of study

Requirements

full-time

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

0

0

Tutorials

Projects/seminars

0

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Wydział Technologii Chemicznej

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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 was to provide students with basic knowledge in the field of industrial chemistry from the laboratory to the industrial installation, as well as developing the ability to search literature and patent databases. In addition, the goal was to present knowledge on the protection of industrial



property, purification technology, solvents used in chemical technology, as well as conducting reactions using phase transfer catalysis techniques and with the using of microwaves and ultrasounds.

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

Tasks of modern chemical technology. Designing technological processes. Increasing the technological scale. Patent and literature research. Industrial property. Purification Technology. Solvents in organic synthesis (classic and alternative: ionic liquids, perfluorinated liquids and supercritical fluids). Phase transfer catalysis (PTC). Microwave and ultrasonic techniques.

Teaching methods

Lecture: multimedia presentation.

Bibliography

Basic

1. L. Synoradzki, J. Wisiański, 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	2,0
Classes requiring direct contact with the teacher	30	1,2
Student's own work (literature studies, preparation for exam) ¹	20	0,8

¹ delete or add other activities as appropriate