COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organic chemical technology [S1IFar1>TCO]

Course

Field of study
Pharmaceutical Engineering

Year/Semester
3/6

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
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

The student has knowledge of general, organic and inorganic chemistry, knows the basic methods, techniques and tools used in chemical analysis. The student is able to obtain information from literature, databases and other sources, is able to interpret the information obtained, draw conclusions and form opinions. The student is able to apply the acquired knowledge in practice, both during the implementation of professional work and during further education. The student is able to properly set priorities for carrying out a specific task.

Course objective

The aim of the course is to gain knowledge of organic chemical technology.

Course-related learning outcomes

Knowledge:
1. the student knows the rules of environmental protection related to pharmaceutical technology and waste management, has the necessary knowledge about the risks associated with the implementation of chemical and pharmaceutical processes. [k_w9]
2. the student has knowledge of natural and synthetic raw materials, products and processes used in

the pharmaceutical industry. [k_w13]
3. the student has a well-established knowledge of the processes of separation and purification of raw materials and products found in the pharmaceutical, cosmetic and chemical industries. [k_w15]

Skills:
1. the student, based on general knowledge, explains the basic phenomena associated with important processes, distinguishes between types of chemical reactions and has the ability to select them for chemical processes, can characterize different states of matter, the structure of chemical compounds, including medicinal substances, using theories used to describe them, experimental methods and techniques. [k_u2]
2. the student is able to identify the basic processes and unit operations of pharmaceutical engineering and formulate their specifications. [k_u15]
3. the student has the ability to self-study. [k_u24]

Social competences:
1. the student is ready to critically assess their knowledge, understands the need for further education, supplementing their field knowledge and raising their professional, personal and social competences, understands the importance of knowledge in solving problems and is ready to seek expert opinions. [k_k1]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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

Programme content

Individual chemical processes: sulfonation and chlorosulfonation, halogenation, alkylation, acetylation, nitration, nitrosation, diazotization, hydrolysis, esterification, oxidation. Discussion of the synthesis and purification methods of selected organic compounds (including salicylic acid, acetylsalicylic acid, sulfonamides, N-(4-hydroxyphenyl)acetamide, ethyl 4-aminobenzoate).
Selected industrial products in the field of light organic synthesis: pharmaceuticals, surfactants, dyes, fragrances.
The use of biomass as a raw material for organic synthesis.
Environmental protection rules related to pharmaceutical technology (volatile organic compounds, environmentally friendly processes, management of organic waste in the pharmaceutical industry).

Teaching methods

Lecture: multimedia presentation.

Bibliography

Basic
1. E. Grzywa, J. Molenda: Technologia podstawowych syntez organicznych, WNT, Warszawa 1987.
2. R. Bogoczek, E. Kociołek-Balawejder: Technologia chemiczna organiczna. Surowce i półprodukty, Wydawnictwo Akademii Ekonomicznej we Wrocławiu, Wrocław 1992.
3. M. Taniewski: Technologia chemiczna - surowce, WPŚ, Gliwice 1997.
4. B. Burczyk: Biomasa. Surowiec do syntez chemicznych i produkcji paliw, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2011.
5. B. Burczyk: Zielona chemia. Zarys, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006.
Additional
1. K. Weissermel, H.J. Arpe: Industrial organic chemistry, VCH, Weinheim, New York, Basel, Cambridge, Tokio, 1993
2. G.T. Austin: Shreve’s chemical process industries, McGraw Hill Professional, 1984

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,60
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,40