COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organic Chemical Technology - Laboratory - Treatment Processes of Organic Raw Materials

Course

Field of study
Pharmaceutical Engineering
Area of study (specialization)
-
Level of study
First-cycle studies
Form of study
full-time

Year/Semester
3/6
Profile of study
general academic
Course offered in
polish
Requirements
elective

Number of hours

Lecture
0
Tutorials
0
Laboratory classes
30
Projects/seminars
0
Other (e.g. online)
0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
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Wydział Technologii Chemicznej

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Responsible for the course/lecturer:

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 in the field of organic chemical technology, especially in the area of unit processes used to process organic raw materials.

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]

4. A student in a professional and research environment is able to plan and organize individual and team work as well as work both individually and as a team. [K_U25]

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]

2. The student is ready to make independent decisions and lead the team, critically assess his own activities and the team's activities, accept responsibility for the effects of these activities and is able to interact and work in a group, inspire and integrate the professional environment. [K_K2]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:
Current control during laboratory classes. Depending on the situation during the academic year, two forms of crediting will be possible: full-time and remote.

Programme content

During the laboratory the student performs exercises illustrating the process of alkylation (tertiary amine quaternization), sulfation (sulfation of dodecyl alcohol), acetylation (acetylation of p-aminophenol with acetic anhydride), esterification process (meclofenoxate obtaining), oxidation using ozone, hydrolysis of complex sugars (hydrolysis sucrose to obtain invert sugar or hydrolysis of starch to obtain simple sugars), as well as the extraction of essential oils by distillation with steam (limonene extraction).

Teaching methods

Reports from laboratory exercises, oral / written answer, assessment of team work; assessment criterion: 3 - basic theoretical and practical preparation, ability to prepare reports on laboratory exercises; 4 - practical preparation supported by theoretical knowledge, the ability to formulate appropriate conclusions, active participation in classes supported by the desire to obtain additional knowledge; 5 - complete preparation for didactic classes, the ability to formulate conclusions at an advanced level, precise performance of assigned tasks, independent search for additional theoretical knowledge, coordination of work in a research team, ambitious approach to the subject matter.

Bibliography

Basic

1. E. Grzywa, J. Molenda: Technologia podstawowych syntez organicznych, T. 1 i 2, WNT, Warszawa 2008.

2. E. Kociołek-Balawejder (red.): Technologia chemiczna organiczna: wybrane zagadnienia, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, 2013.

3. M. Taniewski: Technologia chemiczna - surowce, Wydawnictwo Politechniki Śląskiej, Gliwice 1997.

4. M. Stasiewicz (red.): Technologia chemiczna organiczna, ćwiczenia laboratoryjne, Wydawnictwo Politechniki Poznańskiej, Poznań, 2013.

5. B. Burczyk: Biomasa. Surowiec do syntez chemicznych i produkcji paliw, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2011.

6. R. Zieliński: Surfaktanty - budowa, właściwości, zastosowania, Wydawnictwo: Uniwersytet Ekonomiczny w Poznaniu, Poznań 2017.

Additional

1. J.A. Moulijn, M. Makkee, A. van Diepen: Chemical Process Technology, Wiley-Blackwell, Chichester 2013.

2. M. Taniewski: Przemysłowa synteza organiczna.Kierunki rozwoju, Wydawnictwo Politechniki Śląskiej, Gliwice 1991.

3. B. Burczyk: Zielona chemia. Zarys, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	2,0
Classes requiring direct contact with the teacher	30	0,6
Student's own work (literature studies, theoretical preparation for laboratory classes, preparation of test results and preparation of laboratory reports [1]	70	1,4

[1] delete or add other activities as appropriate