COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organic technology [S1IChiP1>TO]

Course

Field of study
Chemical and Process 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
30

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

prof. dr hab. inż. Juliusz Pernak
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Lecturers

Prerequisites

Student has knowledge of general, organic and inorganic chemistry, knows basic methods, techniques and tools used in chemical analysis. Student is able to obtain information from literature, databases and other sources, is able to interpret obtained information, draw conclusions and formulate opinions. Student is able to apply the acquired knowledge in practice, both during his professional work and during further education. Student is able to cooperate and work in a group. Student is able to adequately determine priorities for the realization of a given task.

Course objective

Obtaining knowledge of organic chemical technology.

Course-related learning outcomes

Knowledge:
1. student has knowledge of raw materials, products and processes used in the chemical industry and of the directions of development of the chemical industry in the country and worldwide [k_w09]
2. student has a structured general and detailed knowledge of chemical technology [k_w13]
3. student is familiar with basic methods, techniques, tools and materials used to solve simple organic

chemical technology tasks. [k_w15]

Skills:
1. student has the ability to self-study. [k_u05]
2. student is able to analyse and evaluate the functioning of basic processes and unitary operations of chemical technology . [k_u16]

Social competences:
1. student understands the need for further education and improvement of his professional and personal competences.- [k_k03]
2. student is aware of the responsibility for his own work and willingness to submit to teamwork and take responsibility for jointly performed tasks.- [k_k04]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture - written examination; evaluation criterium: 3 - 50.1-70.0%; 4 - 70.1-90.0%; 5 - from 90.1%
Laboratory: current control during laboratory classes, oral/written response, reports of laboratory exercises, oral/ written response, evaluation of teamwork; evaluation criterium: 3 - basic theoretical and practical preparation, the ability to prepare reports from 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 teaching classes, the ability to formulate conclusions at an advanced level, precise performance of the tasks entrusted, independent search for additional theoretical knowledge, coordination of work in a research team.

Programme content

1. Energy sources (from coal to nuclear energy).
2. Technological principles (the principle of potential difference, best use of raw material, best use of energy, best use of equipment, technological moderation). The principle of patent purity.

Course topics

none

Teaching methods

3. Chlorination process (basic reactions, chlorinating agents, organic chemistry, thermodynamics and kinetics, examples, waste and its disposal, technological schemes).
4. Alkylation process (reactions, alkylating agents, Friedel-Crafts process, high octane gasoline, waste and its utilization, technological schemes).
5. Neutralization technology.
6. Biomass as a chemical raw material (oils and fats, lignocellulose products, soaps, fatty acids, glycerine, biological activity products, technological schemes).
7. Ionic liquids (synthesis, properties, application, disposal, green solvents).

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. B. Burczyk: Zielona chemia. Zarys, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2014.

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. P. Wasserscheid, T. Welton: Ionic liquids in synthesis, Wiley-VCH, Weinheim 2003.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	70	2,80
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,20