COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organic Chemical Technology

Course

Field of study
Chemical Technology

Year/Semester
III/6

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
30

Other (e.g. online)

Tutorials
15

Projects/seminars

Number of credit points

6

Lecturers

Responsible for the course/lecturer:
dr hab inż. Michał Niemczak; e-mail: michal.niemczak@put.poznan.pl; tel.: +48 616653581; Poznan University of Technology; Faculty of Chemical Technology; Institute of Technology and Chemical Engineering; Berdychowo 4; 61-131 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge: Student starting this subject should have a systematic, theoretically founded general knowledge of general and inorganic, organic, physical and analytical chemistry

Skills: The student starting this subject should be able to:

1. Obtain the necessary information from literature, databases and other sources and other concerning chemical sciences, correctly interpret them, draw conclusions, formulate and justify opinions

2. Work both individually and as a team in a professional environment

3. Possess language skills in the fields and disciplines relevant to chemical sciences and chemical technology, in accordance with the requirements set out for level B2 of the European Language Training Description System

4. Use chemical terminology and chemical nomenclature correctly, also in English

Social competences: The student starting this subject should:

1. Be able to interact and work in a group, inspire and integrate engineering environments

2. Be able to properly set priorities for the implementation of the task

Course objective

Gain the knowledge in the field of organic chemical technology.

Course-related learning outcomes

Knowledge

Student:

1. Has the necessary knowledge about both natural and synthetic raw materials, products and processes used in chemical technology, as well as about the directions of development of the chemical industry in the country and in the world (K_W09)

2. Possesses knowledge in the field of technology and chemical engineering, machine science and apparatus of the chemical industry (K_W13)

3. Knows the basic methods, techniques, tools and materials used to solve simple tasks in the field of chemical technology and engineering (K_W15)

Skills

Based on general knowledge, student explains the basic phenomena associated with relevant processes in chemical technology and engineering (K_U16)

Social competences

Student:

1. Is able to cooperate and work in a group, inspire and integrate engineering environments (K_K03)

2. Is able to properly set priorities for the implementation of the task (K_K04)

3. Understands the need for further training and improving his professional, personal and social competences (K_K01)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Regular control during laboratory classes, tests during exercises, final (written) exam.

Assessment criteria (lecture - exam):

very good - from 90.1%

good - 70.1-90.0%

fine - 50.1-70.0%

Assessment criteria (laboratory classes):

very good - the student knows and is able to comprehensively characterize all the required issues related to the implementation of a given laboratory exercise, the student is fully prepared to perform the practical part of the course

good - the student knows and is able to characterize most of the required issues related to the implementation of a given laboratory exercise, the student is prepared to perform the practical part of the course

fine - the student is able to characterize some issues related to the implementation of a given laboratory exercise, the student is prepared to perform the practical part of the course

Assessment criteria (tutorials):

very good - the student knows and is able to comprehensively solve tasks related to selected elements of organic chemical technology specified in the program content

good - the student knows and is able to solve most tasks related to selected elements of organic chemical technology specified in the program content

satisfactory - the student is able to characterize some of the tasks related to selected elements of organic chemical technology specified in the program content

Programme content

Energy sources (with and without CO2 emissions); unit processes (chlorination, alkylation process - alkylating agents, alkylation of benzene to ethylbenzene; esterification process - production of low-volatile, medium-volatile and difficult-volatile ester on examples; oxidation process - thermodynamic and kinetic bases; nitration process - nitrating mixture, process safety) examples and technological schemes ; CFCs; high octane gasoline; synthesis of pharmaceuticals and agrochemicals; waste, waste management; ionic liquids (synthesis, properties, applications); synthesis strategy in chemical technology; globalization in the chemical and petrochemical industry.

Teaching methods

1. Lecture - multimedia presentation

2. Laboratory classes - performing laboratory tasks with organic chemical technology on the basis of prepared exercises

3. Tutorials - solving calculative tasks in organic chemical technology

Bibliography

Basic

1. K. Weissermel, H.-J. Arpe: Industrial organic chemistry : important raw materials and intermediates, Weinheim ; New York, 1978

2. H. A. Wittcoff, B. G. Reuben, J. S. Plotkin, Industrial Organic Chemicals, John Wiley & Sons, 2013

3. E. Grzywa, J. Molenda: Technologia podstawowych syntez organicznych, WNT, Warszawa 1987

4. M. Taniewski: Technologia chemiczna - surowce, WPŚ, Gliwice 1997

5. M. Stasiewicz: Technologia chemiczna organiczna, ćwiczenia laboratoryjne, Wydawnictwo Politechniki Poznańskiej, Poznań, 2013

6. R. Buczkowski : Biomasa w energetyce, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, Toruń, 2012

7. A. S. Matlack: Introduction to green chemistry,Basel, Marcel Dekker, New York, 2001

Additional

1. P. Wiseman: An Introduction to Industrial Organic Chemistry, Applied Science, London, 1976

2. H. L. White: Introduction to Industrial Chemistry, John Wiley, New York, 1986

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	90	3,6
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	60	2,4

[1] delete or add other activities as appropriate