COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organic chemistry [S1IFar2>CO1]

Course

Field of study
Pharmaceutical Engineering

Year/Semester
1/2

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
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

At the beginning of the course, the student should possess basic knowledge regarding general chemistry (e.g. atomic structure, symbols and properties of elements, formulas of chemical compounds, formation of chemical bonds, chemical reactions) and physics (e.g. the phenomenon of state change). In addition, the student should be able to obtain information using the indicated sources and be aware of the need to develop their competences.

Course objective

The aim is to ensure that students acquire basic theoretical and practical knowledge in the field of organic chemistry. The specific objectives include gaining proficiency in: issues related to nomenclature, structure, synthesis methods and properties of hydrocarbons (alkanes, alkenes, alkynes and aromatic compounds) and other groups of organic compounds (e.g. alcohols, aldehydes and ketones, carboxylic acids and their derivatives as well as amines).

Course-related learning outcomes

Knowledge:
1. Has knowledge of physics and chemistry which allows to understand the phenomena and changes

occurring in technological and environmental processes. [K_W2]
2. Has a systematized, theoretical knowledge regarding inorganic, organic, physical and analytical chemistry. [K_W4]
3. Has knowledge regarding raw materials, products and processes used in closed-loop technologies. [K_W10]

Skills:
1. Can obtain information using literature reports, databases and other sources related to closed-loop technologies, also in a foreign language, integrate them, interpret them, draw conclusions and formulate opinions. [K_U1]
2. Plans, selects equipment and scientific apparatus, carries out research, analyzes the results and formulates conclusions on this basis. [K_U3, K_U9]
3. Correctly uses nomenclature and terminology in the field of closed-loop economy, chemistry, technology and chemical engineering, environmental protection and related disciplines, and properly applies it in discussions, also in a foreign language. [K_U5]

Social competences:
1. Cares about his own safety and the safety of and others during work, applies appropriate procedures and rules in emergency situations. [K_K4]
2. Objectively assesses the level of knowledge and skills, understands the importance of improving professional and personal competences adequately to the changing social conditions and the progress of science. [K_K5]
3. Is aware of the negative impact of human activity on the state of the environment and actively counteracts its degradation. [K_K7]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:
After the end of the lecture series, the knowledge of students will be verified based on the results of the final examination.
Evaluation in stationary mode:
Written test with 10 open questions regarding theoretical and practical issues.
Evaluation in on-line mode:
Test with 10 open questions regarding theoretical and practical issues carried out with the use of the eKursy platfrom.
A passing grade is obtained when the number of points is greater than 50% of the accepted maximum.
Tutorials:
During the series of tutorials, the knowledge of students will be verified based on 2 tests with 5 questions regarding practical synthetic problems. Additionally, the progress will be controlled using short tests carried out during the following classes.
Evaluation in stationary mode:
Written tests.
Evaluation in on-line mode:
Tests carried out with the use of the eKursy platfrom.
A passing grade is obtained when the number of points is greater than 50% of the accepted maximum.

Programme content

The program covers the following topics:
1. Nomenclature of organic compounds.
2. Classification of organic compounds.
3. Properties of organic compounds.
4. Basic types of reactions in organic chemistry.
5. Methods for the synthesis of hydrocarbons.

Course topics

The first part of the course wukk be focused on the following issues: the nomenclature of organic compounds, the fundamental division of organic compounds with regard to selected functional groups,

the relationship between the chemical structure and the properties of organic compounds (reactivity-stability, acid-base conjugate pairs, electrophilicity and nucleophilicity), basic types of reactions in used organic chemistry (substitution, elimination, addition, rearrangement), isomerism and types of isomers, methods of synthesis and properties of hydrocarbons (alkanes, alkenes and alkynes), resonance and the concept of aromaticity, the influence of substituents on the reactivity of benzene derivatives, fundamental elements of synthesis of aromatic hydrocarbons.

Teaching methods

The lecture includes a multimedia presentation of the discussed content and involving students in scientific discussions.
Tutorials include the use of knowledge obtained during lectures to record mechanisms and plan syntheses depending on the reaction conditions and reactivity of the discussed compounds.

Bibliography

Basic:
1. John McMurry, Organic Chemistry, Polish Scientific Publishers PWN.
2. Robert Morrison, Robert Boyd, Organic Chemistry, Polish Scientific Publishers PWN.

Additional:
1. Arthur Vogel, Organic Preparation, Polish Scientific Publishers PWN.
2. Susan McMurry, Organic Chemistry, Polish Scientific Publishers PWN.
3. Jerry March, Organic Chemistry. Reactions, mechanisms, construction. Scientific and Technical Publishers.
4. Daniela Buza, Aleksandra Ćwil, Organic chemistry exercises with solutions. PW Publishing House.
5. Polish Chemical Society, Nomenclature of Organic Compounds.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00