COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organic chemistry [S1IFar2>CO2]

Course

Field of study
Pharmaceutical Engineering

Year/Semester
2/3

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
0

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

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]

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_U8]
3. Correctly uses nomenclature and terminology in the field of chemistry, technology and chemical engineering, environmental protection and related disciplines, and properly applies it in discussions, also in a foreign language.[K_U3]

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]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Laboratories:
During the series of laboratory classes, the knowledge of students will be verified based on short tests regarding theoretical knowledge in the scope of the exercise. In addition, the knowledge regarding the course of the exercise and practical knowledge necessary to safely conduct the experiment will be verified by the teacher.
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 based on correctly conducting the planned experiments as well as passing the tests and questions.

Programme content

The program covers the following topics:
1. Synthetic methods.
2. Characteristic reactions of selected groups of organic compounds.
3. Methods for purifying organic compounds.
4. Analysis of synthesis products for purity and reaction efficiency.

Course topics

The second part of the course will include topics associated with: methods of synthesis (at laboratory and industrial scale) and characteristic reactions of selected groups of organic compounds which are crucial in terms of practical importance - halogenated hydrocarbons, ethers, alcohols and phenols, aldehydes and ketones, carboxylic acids, acid derivatives and amines. Particular emphasis will be focused on the aspects of the mutual relationship between individual groups, intraconversion of functional groups, limitations and problems at the stage of synthesis of individual organic compounds as well as the concept of retrosynthesis and planning of multi-stage reactions.
In addition, laboratory classes will be carried out to obtain practical knowledge in the field of basic methods of purification of organic compounds (distillation, crystallization and extraction), the synthesis of simple and advanced organic compounds and the analysis of products in terms of purity and reaction efficiency.

Teaching methods

Laboratories include training in occupational health and safety, the use of basic laboratory equipment, basic methods of analysis and purification of organic compounds as well as practical implementation of syntheses along with keeping a laboratory journal.

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	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00