COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to organic chemistry [S1Bioinf1>CHEMORG]

Course

Field of study
Bioinformatics

Year/Semester
1/1

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
15

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

6,00

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, 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), especially in terms of their interactions with living cells and organisms.

Course-related learning outcomes

Knowledge:
K_W04 the graduate knows and understands issues in the field of chemistry useful for formulating and

solving simple bioinformatics tasks, including the basic concepts and laws of chemistry, organic chemistry and biochemistry
K_W08 the graduate knows and understands selected groups of bioactive compounds, their biochemical properties and the effect on cells and living organisms P6U_W
K_W19 the graduate knows and understands the techniques and methods of identifying biomolecules and biologically active compounds P6U_W

Skills:
K_U01 the graduate is able to obtain information using literature, databases and other properly selected sources, also in English P6U_U
K_U03 the graduate can use basic laboratory techniques for the synthesis, isolation and purification of chemical compounds, including biomolecules and biologically active compounds P6U_U
K_U07 the graduate is able to use analytical, simulation and experimental methods to formulate and solve research tasks under the supervision of a research tutor. P6U_U

Social competences:
K_K02 the graduate is ready to cooperate and work in a group, assuming various roles in it P6U_K
K_K03 the graduate is ready to define priorities for the implementation of a task defined by himself or other P6U_K
K_K06 the graduate is ready to take responsibility for the safety of his own work and that of others; taking appropriate actions in emergency states P6U_K

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture:
After the end of the lecture series, the knowledge of students will be verified based on a written exam with 10 open questions regarding theoretical and practical issues. 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. A passing grade is obtained when the number of points is greater than 50% of the accepted maximum.
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. A passing grade is based on correctly conducting the planned experiments as well as passing the tests and questions.

Programme content

The course will cover the following theoretical issues: nomenclature and structure of organic compounds, reactivity and properties of individual compound groups, isomerism, reaction mechanisms and properties of hydrocarbons (alkanes, alkenes, alkynes), aromaticity and resonance, properties of other organic compounds (halogen derivatives, ethers, alcohols and phenols, aldehydes and ketones, carboxylic acids and their derivatives as well as amines), basic planning of syntheses and 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), thecharacteristic reactions of bioorganic compounds and the analysis of products in terms of purity and reaction efficiency.

Course topics

none

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.
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	150	6,00
Classes requiring direct contact with the teacher	60	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	90	3,00