COURSE DESCRIPTION CARD - SYLLABUS

Course name
Advanced methods of synthesis of API [S1IFar1>ZMSAPI]

Course

Field of study
Pharmaceutical 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
elective

Number of hours

Lecture
0

Laboratory classes
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Structured, theoretically founded knowledge in the field of organic, physical and drug chemistry, as well as from the basic course of Synthesis and technology of drugs.

Course objective

Providing providing knowledge in scope of modern methods of organic synthesis, which allow for the creation of new bonds in molecules. Developing students" skills in solving basic problems in the field of single-stage syntheses of active compounds, the ability to select synthesis methods and apply the latest techniques (e.g. two-phase reactions, enzymatic catalysis)

Course-related learning outcomes

Knowledge:
k_w4 has structured, theoretically founded general knowledge in the field of inorganic, organic, physical and analytical chemistry enabling understanding, description and investigation of chemical phenomena and processes related to pharmaceutical engineering
k_w7 knows the basic techniques, methods for characterization and identifying pharmaceutical products and research tools used in pharmaceutical engineering, knows the classical and instrumental

methods used in assessing the quality of substances for pharmaceutical purposes and in quantitative analysis in drugs, knows the physicochemical properties of substances for pharmaceutical purpose on the activity of drugs, knows the classification of analytical techniques together with the criteria for the selection of methods and their validation
k_w24 has basic knowledge in the field of searching for new drugs, natural and synthetic products as well as their biochemical and molecular gripping points, pharmacopoeial standards and norms related to pharmaceutical engineering; knows methods and techniques for researching new drug substances in chemical, pharmaceutical and toxicological terms
k_w14 knows the development of pharmaceutical engineering and research methods used in it, as well as directions of development of the pharmaceutical industry in the country and all over the world
k_w15 has solid knowledge in the field of separation and purification processes of raw materials and products found in the pharmaceutical, cosmetics and chemical industries

Skills:
k_u1 understands literature in the field of pharmaceutical engineering in polish; reads and understands simple scientific and technical texts in english, is able to obtain information from literature, databases and other sources related to pharmaceutical engineering, also in english, is able to integrate and interpret them, draw conclusions and formulate opinions
k_u2 is able to explain the basic phenomena associated with significant processes, to distinguish between types of chemical reactions and has the ability to select them for chemical processes, can characterize various states of matter, the structure of chemical compounds, including drug substances, using theories of their description, methods and experimental techniques
k_u8 uses basic techniques, research equipment and apparatus useful in biotechnology, synthesis and analysis of pharmaceutically active substances, dosage form technology and toxicology, appropriate for pharmaceutical engineering, uses pharmacopoeial methods, prepares documentation

Social competences:
k_k1 is aware of the need for lifelong learning and professional development
k_k2 is ready to make an independent decisions and lead a team, critically assess his own actions and those of the team, take responsibility for the effects of these activities and is able to cooperate and work in a group, inspire and integrate the professional environment
k_k6 is able to think and act in a creative and entrepreneurial way

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Knowledge is verified during oral statements during classes and during tests in open questions. Correct chemical language explains issues and describes the latest ways to solve problems related to the synthesis of organic compounds. In the case of on-line classes, the verification of knowledge will be carried out in the same form on the eMeeting platform.

Programme content

Discussing in selected thematic blocks, with the active participation of students, selected types of modern chemical reactions: stereoselective condensation, reduction, synthesis using phase transfer catalysis, coupling reactions. Solving problem tasks, observation and discussion of sample syntheses

Teaching methods

Multimedia presentation introducing the topic, projection of the course of synthesis and analysis of products, current literature on the topic

Bibliography

Basic
1. J.Clayden, N. Greeves, S. Warren , P. Wothers, Chemia organiczna, tom I, II i III, WNT, Warszawa 2009.
2. J. Gawroński, K. Gawrońska, K. Kacprzak, M. Kwit, Współczesna synteza organiczna, PWN, Warszawa 2004 C. Willis, M. Wills, Synteza organiczna, Wyd. Uniwersytetu Jagiellońskiego, Kraków 2004
Additional
1. J. Skarżewski - Wprowadzenie do syntezy organicznej, PWN, Warszawa 1999

2. M.B. Smith, J. March, Advanced Organic Chemistry, Reaction, Mechanism and Structure, J.Wiley & Sons, New Jersey 2007
3. R.B. Silverman, Chemia organiczna w projektowaniu lekow, WNT, 2004.
4. G.L. Patrick, Chemia medyczna podstawowe zagadnienia, WNT, 2003.

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,00
Classes requiring direct contact with the teacher	20	0,60
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,40