

**86S1-PCHO1**

**FUNDAMENTALS OF ORGANIC CHEMISTRY I**

**ECTS: 4.0**

**HOURS PER SEMESTER/WEEK:** LECTURES: 30/2; CLASSES: 45/3

**FIELD OF THE STUDY:** Chemistry

**Level of study:** First-cycle (Bachelor's degree) program

**Course status:** obligatory \*

**Year of the study:** I

#### **COURSE CONTENTS**

**LECTURES:** Introduction to organic chemistry and molecular orbitals. Aliphatic hydrocarbons, introduction of nomenclature and isomerism. Aromatic hydrocarbons, resonance, influence of electronic structure on reactivity and properties. Heterocyclic aromatic compounds. Moebius-like aromaticity. Electrocyclic reactions. Mass spectrometry, spectroscopic methods. Chemistry of natural products.

**CLASSES:** Basic techniques in organic laboratory: crystallization, distillation (simple one, steam and under reduced pressure), chromatography, isolation of natural products, sublimation. Synthesis and purification of dyes.

**EDUCATIONAL PURPOSE:** Acquaintance of the student with basic knowledge about aliphatic and aromatic hydrocarbons and halogen organic compounds (including their 3D structure), understanding of the dependence between structure and properties of compound, explanation of the basic mechanism of organic reactions, and presentation of analytical methods used for determination of structure of organic compounds. Laboratory is done in order to teach how practically proceed with organic synthesis.

#### **LEARNING OUTCOMES**

**Knowledge.** The student knows the properties of the basic groups of organic compounds. He knows the types of bonds and their influence on properties of organic compounds. He knows the nomenclature of chemical compounds in the field of organic chemistry. He understands the role of experimental work in natural sciences.

**Skills.** Student knows how to write down the transformations of organic compounds by means of the equations of chemical reactions. He understands their relationship with changes taking place in nature, correctly uses the nomenclature of organic compounds. He can design and assemble simple apparatus for organic syntheses.

**Social competences.** The student understands the need for lifelong learning. Can work in a group, performing various functions in it. He understands the need to adopt a pro-ecological attitude.

#### **TEACHING FORMS AND METHODS**

**Lectures.** Information lecture, lecture with multimedia presentation.

**Classes.** Laboratory classes - performing laboratory tasks in small teams of 2.

#### **FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES**

**Lectures.** Written exam - credit with a grade.

**Classes.** Performance of all the experiments accompanying by written reports - credit with grade.

#### **BASIC LITERATURE**

1) Solomons T.W. Graham, Fryhle Craig B., Snyder Scott A. 2022. Chemia organiczna, Tom 12, Wyd. PZWL. 2) McMurry J. 2017. OChemia Organiczna, Tom 1-5, Wyd. PWN

#### **ADDITIONAL LITERATURE**

1) Graham P. 2002. Krótkie wykłady z chemii organicznej, Wyd. PWN

#### **THE TEACHER/TEACHERS CONDUCTING THE CLASSES:**

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