UNIVERSITY OF WARMIA AND MAZURY
Faculty of Agriculture and Forestry

86S1-PCHO2 **FUNDAMENTALS OF ORGANIC CHEMISTRY II** **ECTS: 8.0**

HOURS PER SEMESTER/WEEK: LECTURES: 30/2; CLASSES: 75/5
FIELD OF THE STUDY: Chemistry
Level of study: First-cycle (Bachelor's degree) program

Course status: obligatory *
Year of the study: II

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: To teach the student about reactivity of functionalized organic compounds. Learning about variable classes of organic compounds (alongside with their 3D arrangement), understanding the relation between structure and physicochemical properties, More detailed information on mechanisms of organic reactions and presentation of some synthetic procedures. At the laboratory student will gain the knowledge about basic experimental techniques of organic chemistry and basic types of chemical transformations.

LEARNING OUTCOMES

Knowledge. Student recognizes and is able to discuss various classes of organic compounds and is able to analyse their structures. Knows the organic chemistry nomenclature and understands mechanisms of reactions. Knows and understands rules and regulations of Occupational Safety and Health, especially rules of safe use of organic reagents and of their utilization.
Skills. Student is able to analyse the properties of certain organic compounds basing on their electronic structure and presence of functional groups. Student knows certain classes of organic compounds and mechanisms of their reactions. Student knows how to use standard preparative chemistry lab techniques. Student is able independently plan and carry-out simple organic chemistry experiments and to evaluate their effects. Student knows and is able to use basic nomenclature of organic compounds. Student is able to perfect and complete his/her knowledge and skills.
Social competences. Student is aware of the influence of chemistry on environment and s ready to solve the problems connected with selection and utilization of chemical wastes according to professional ethical rules. Student is aware about the necessity of the development of chemical industry for civilization development.

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. Performation of all the experiments accompanying by written reports - credit with a 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. 0Chemia Organiczna, Tom 1-5, Wyd. PWN

ADDITIONAL LITERATURE

1) Condori Apaza, Renée M.; Feliz Poicon, Edwin Carlos L.; Conde Pizarro, Omar A. 2020. Organic Chemistry: Practical Organic Chemistry Laboratory Manual. Wyd. Our Knowledge Publishing

THE TEACHER/TEACHERS CONDUCTING THE CLASSES:

prof. dr hab. inż. Paweł KAFARSKI pawel.kafarski@uwm.edu.pl
Department of Chemistry, Plac Łódzki 4, 10-721 Olsztyn, POLAND

* note: optional course availability depends on Polish students' choice!