

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Organic chemistry</b>		Code <b>1010701331010720012</b>
Field of study <b>Environmental Protection Technologies</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>3</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>3</b>
Status of the course in the study program (Basic, major, other) <b>other</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b>  dr hab. inż. Aleksandra Borowiak-Resterna email: aleksandra.borowiak-resterna@put.poznan.pl tel. 616653689 Faculty of Chemical Technology ul. Piotrowo 3 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	The student has a basic knowledge of general and organic chemistry at the level of general education school.
2	<b>Skills</b>	1. The student is able to solve the simple problem tasks of organic chemistry based on his knowledge. 2. The student has the ability to obtain information from the identified sources.
3	<b>Social competencies</b>	The student is aware of the need to broaden his knowledge.
<b>Assumptions and objectives of the course:</b> 1. Provide students with basic knowledge of organic chemistry, to the extent specified by the content of the curriculum of the environmental technologies field of study. 2. Develop students' ability to solve basic problems in the synthesis of simple organic compounds and the problems related to the reactivity of compounds containing various functional groups. 3. Develop students' awareness of the responsibility for their future decisions relevant to the chemical engineer work.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. The student has ordered, theoretically founded general knowledge in the field of organic chemistry; the student knows the issues related to the theory of orbitals and resonance, and characteristic reactions (including mechanisms) of major groups of organic compounds, including biomolecules. - [K_W07] 2. The student is able to plan the method of synthesis of simple organic compounds with different functional groups which may be used in chemical industry; The student is able to characterize the substrates needed and he is able to analyze the resulting products. - [K_W06] 3. The student is aware of the need to use appropriate precautions when using different groups of organic compounds in laboratory and industrial processes. - [K_W05]		
<b>Skills:</b> 1. The student is able to obtain information from the literature, electronic databases and other sources properly selected; he is able to interpret information and draw conclusions. - [K_U01] 2. The student has the ability to self-education. - [K_U06] 3. The student has mastered the basics of the current IUPAC nomenclature of organic chemistry, for both the naming of individual groups of organic compounds and their stereochemistry. - [K_U08]		
<b>Social competencies:</b>		

1. The student understands the need to improve his professional qualifications. - [K\_K01]  
 2. The student is aware of the importance of the decisions on the future of engineering activities, their comprehensive impact on the environment. - [K\_K02]

**Assessment methods of study outcomes**

Assessment of knowledge and skills on the basis of written and oral examination in semester 4.

**Course description**

Introduction: the nomenclature and stereochemistry of organic compounds (IUPAC rules), the theory of orbitals, hybridization, chemical bonding, resonance, polarity of bonds and molecules.

The concept of acidity and basicity. Types of chemical reactions and mechanisms. Transition states, the formation of intermediate products. Kinetically and thermodynamically controlled reactions. Rearrangements. Tautomerism.

Methods of synthesis and reactivity of the major classes of organic compounds: alkanes, alkenes, alkynes, aromatic compounds, alkyl halides, organometallic compounds, alcohols and phenols, aldehydes and ketones, carboxylic acids and their derivatives, amines and nitro compounds.

The basic issues concerning the construction and reactivity of biomolecules: carbohydrates, lipids, amino acids, proteins.

**Basic bibliography:**

1. J. McMurry, Chemia organiczna, PWN, Warszawa 2007.
2. R.T. Morrison, R.N. Boyd, Chemia organiczna, PWN, Warszawa 1998.
3. A. Zwierzak, Zwięzły kurs chemii organicznej, Politechnika Łódzka, Łódź 2002.
4. D. Buza, W. Sas, P. Szczeciński, Chemia organiczna. Kurs podstawowy, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006..
5. D. Buza, A. Ćwil, Zadania z chemii organicznej z rozwiązaniami, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003..

**Additional bibliography:**

1. Przewodnik do nomenklatury związków organicznych, Polskie Towarzystwo Chemiczne, Warszawa 1994.
2. E. Bialecka-Florjańczyk, J. Włostowski, Chemia organiczna, WNT, Warszawa 2005.
3. M. Mąkosza, M. Fedoryński, Podstawy syntezy organicznej. Reakcje jonowe i rodnikowe, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006..

**Result of average student's workload**

Activity	Time (working hours)	
1. Participation in lectures.	45	
2. Participation in consultations related to the preparation for the exam	5	
3. Preparation for the exam, which will be held in semester 4	15	
Student's workload		
Source of workload	hours	ECTS
Total workload	65	3
Contact hours	50	2
Practical activities	0	0