

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Chemical Technology - Industrial Processes of Chemical Synthesis		Code 1010704271010720641
Field of study Chemical Technology	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 20 Classes: 10 Laboratory: 20 Project/seminars: -		No. of credits 6
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 6 100% 6 100%
Responsible for subject / lecturer: Dr Andrzej Skrzypczak email: Andrzej.Skrzypczak@put.poznan.pl tel. (61) 6653681 Wydział Technologii Chemicznej ul. Piotrowo 3, 60-965 Poznań tel.: 061 665 23 51, 061 665 23 52		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	W1 Student has knowledge of general chemistry, organic chemistry and inorganic chemistry, he knows the basic methods, techniques and tools used in chemical analysis
2	Skills	U1 Student can obtain information from literature, databases and other sources, can interpret the information obtained, to draw conclusions and formulate opinions. U2 Student is able to apply that knowledge in practice, both during the implementation work and the further education within the 2 degree education.
3	Social competencies	K1 Student is able to interact and work in a group. K2 Student is able to identify priorities for the implementation of a specific task.
Assumptions and objectives of the course: Achieving knowledge of organic chemical technology.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has the necessary knowledge of both natural and synthetic raw materials, products and processes used in chemical technology. - [K_W09]		
2. He knows the basic methods, techniques, tools and materials used in solving simple tasks of organic chemical technology. - [K_W13]		
Skills:		
1. Student on the basis of general knowledge explains the basic phenomena associated with significant processes in chemical technology. - [K_U16]		
Social competencies:		
1. He is able to interact and work in a group - [K_K03]		
2. He is able to set priorities for implementing the designated task - [K_K04]		
3. He has awareness of the importance of non-technical aspects and effects of engineering activities, including its impact on the environment. He is aware of the responsibility for the taken decisions. - [K_K02]		
Assessment methods of study outcomes		

Checking the knowledge and skills during laboratory classes, colloquia during exercise, the final written exam		
Course description		
Raw materials for organic chemical synthesis industry: petroleum, natural gas, coal, biomass and energy sources. The use of syngas in an organic industrial chemical synthesis. Unit processes, their thermodynamic and kinetic basis: the alkylation process, nitration process, sulfonation process, hydrogenation and oxidation processes, the halogenation process and esterification process. Examples of technological schemes for these processes and the most important issues related to their health and safety, waste management, environmental protection, safety of installations. Basic problems related to the synthetic strategy conducted in the technological scale. Issues related to globalization in the chemical and petrochemical industries.		
Basic bibliography:		
<ol style="list-style-type: none"> 1. E. Grzywa, J. Molenda: Technologia podstawowych syntez organicznych, WNT, Warszawa 1987. 2. M. Stasiewicz Technologia chemiczna organiczna ćwiczenia laboratoryjne Wydawnictwo Politechniki Poznańskiej, Poznań 2013. 3. R. Bogoczek, E. Kociołek-Balawejder: Technologia chemiczna organiczna. Surowce i półprodukty, Wydawnictwo Akademii Ekonomicznej we Wrocławiu, Wrocław 1992. 4. M. Taniewski: Technologia chemiczna - surowce, Wydawnictwo Politechniki Śląskiej, Gliwice 1997. 5. B. Burczyk: Biomasa. Surowiec do syntez chemicznych i produkcji paliw, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2011. 6. E. Kociołek-Balawajder: Technologia chemiczna organiczna Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2013. 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. K. Weissermel, H.J. Arpe: Industrial organic chemistry, VCH, Weinheim, New York, Basel, Cambridge, Tokio, 1993 K. Weissermel, H.J. Arpe: Industrial Organic Chemistry, VCH, Weinheim, New York, Basel, Cambridge, Tokio, 1993. 2. G.T. Austin: Shreve's Chemical Process Industries, McGraw Hill Professional, 1984. 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	20	
2. Participation in laboratory classes	20	
3. Participation in class exercises	10	
4. Participation in class exercises	30	
5. Preparation for laboratory classes	30	
6. Participation in consultation	30	
7. Exam (preparation and the presence of the exam)	10	
Student's workload		
Source of workload	hours	ECTS
Total workload	150	6
Contact hours	70	3
Practical activities	80	3