

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Process Equipment</b>		Code <b>1010701131010720519</b>
Field of study <b>Chemical and Process Engineering</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 4</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>15</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars:		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>basic</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>Technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b> dr hab. inż. Szymon Woziwodzki email: <a href="mailto:szymon.woziwodzki@put.poznan.pl">szymon.woziwodzki@put.poznan.pl</a> tel. +48 61 6652147 Faculty of Chemical Technology ul. Berdychowo 4 61-131 Poznan		
<b>Responsible for subject / lecturer:</b>		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	- knowledge of graphic symbols of equipment used in the creation of technological schemes in accordance with the PN EN standard - knowledge of momentum exchange process equipment - principles of design documentation, - basis of materials science and mechanical engineering
2	<b>Skills</b>	- selection of momentum exchange process equipment
3	<b>Social competencies</b>	-The student is aware of the advantages and limitations of individual and group work in solving the problems of an industrial nature and design, - The student knows the limits of his knowledge and sees the need to deepen their knowledge.
<b>Assumptions and objectives of the course:</b>		
Obtaining knowledge about apparatus used in mass exchange unit operations performed in the chemical and related industries		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Knowledge of the basic types of apparatus used in the mass exchange processes and other. - <b>[K_W13, K_W14]</b>		
2. Knowledge of advantages and disadvantages of major process equipment. - <b>[K_W13, K_W14]</b>		
<b>Skills:</b>		
1. The graduate can analyze and evaluate the way of functioning of basic processes and individual operations in chemical and process engineering - <b>[K_U16]</b>		
2. The ability to select the basic mass transfer equipment - <b>[K_U19]</b>		
<b>Social competencies:</b>		

1. The graduate understands the need to develop and improve his/her professional and personal competencies. - **[K\_K01]**
2. The graduate knows the limits of his own knowledge and understand the need for continuing of education. - **[K\_K01]**

<b>Assessment methods of study outcomes</b>		
<b>Knowledge</b>		
Exam (multiple-choice test) – 1-2 Additional question (oral, (in case of 1point missing to pass the exam))		
<b>Skills</b>		
Exam – 1-2		
<b>Social competencies</b>		
Exam – 1-2		
<b>Course description</b>		
During the course are discussed: Principles of distillation and principles of operation and selection of distillation equipment and rectification columns, installations of extractive and azeotropic distillation, reactive distillation, construction of tray columns, types of trays and types of flow on trays; principles of absorption, construction of packed columns, types of packings, unfavourable phenomena on packing, principles of extraction, construction of tray and packing extraction columns, stirred extraction columns, and pulsed extraction columns; periodic dryers; crystallizers of liquids and gases; chemical reactors: tank and tubular		
<b>Basic bibliography:</b>		
1. J. Warych, Aparatura chemiczna i procesowa, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2004		
2. H. Błasiński, B. Młodziński, Aparatura przemysłu chemicznego , WNT, Warszawa, 1983		
3. J. R. Couper, W. R. Penney, J. R. Fair, S. Walas, Chemical Process Equipment - Selection and Design, Elsevier 2010.		
<b>Additional bibliography:</b>		
1. Aparatura chemiczna, Pikoń J., Państwowe Wydawnictwa Naukowe, Warszawa, 1983		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in consultation	10	
3. Preparation for the exam	25	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	50	2
Contact hours	15	1
Practical activities	0	0