

FACULTY OF CHEMISTRY					
<b>SUBJECT CARD</b>					
Name in Polish		Projekt procesowy			
Name in English		Process project			
Main field of study (if applicable)		Chemical Technology			
Specialization (if applicable)		Technology of fine chemicals			
Level and form of studies:		2nd level, full-time			
Kind of subject		obligatory			
Subject code		TCC024018w			
Group of courses		NO			
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15				
Number of hours of total student workload (CNPS)	30				
Form of crediting	crediting with grade				
For group of courses mark (X) final course					
Number of ECTS points	1				
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	0.5				
<b>PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES</b>					
1. Chemical technology 2. Chemical engineering 3. Technological project					
<b>SUBJECT OBJECTIVES</b>					
C1	Providing the students with main tasks in industrial plants design and analysis of investment feasibility, rules of elaboration of process project of the plant.				
C2	Acquiring fundamental knowledge about the systems delivering raw materials and energy, about preparing process data for design, about requirements concerning quality of raw materials and the products.				
C3	Providing the students with rules of elaboration of production process course in designed industrial plant, including the rules of general scheme preparation and making technological-equipment scheme in a process project.				
C4	Providing the students with the selection rules of process equipment, instruments, constructional materials, selection method of measurement and control instruments in a designed plant.				
C5	Presentation of correct estimation of investment costs and calculation of exploitation costs of the designed plant.				

SUBJECT LEARNING OUTCOMES		
<b>Relating to knowledge:</b>		
PEK_W01 – Knows the design rules for industrial plants, knows the rules for process project elaboration and making the analysis of investment feasibility,		
PEK_W02 – Knows the systems delivering raw materials and energy, can make analysis and prepare process data necessary for design, has the knowledge about quality requirements of raw materials and manufactured products, as well as about requirements concerning their storage,		
PEK_W03 – Can elaborate production process course in the designed plant,		
PEK_W04 – Knows selection rules of process apparatuses, equipment, adjustment of constructional materials and providing the designed plant in measurement and control instruments,		
PEK_W05 – Knows how to estimate the investment costs and how to calculate operational costs.		
PROGRAMME CONTENT		
Form of classes – lecture		Number of hours
Lec 1	Industrial plant. Design rules of industrial plants. Analysis of investment feasibility.	2
Lec 2	Technological-economical assumptions. Elaboration rules of the process project of industrial plant. Design assumptions.	2
Lec 3	Systems delivering raw materials and energy. Products, wastes. Environment protection.	2
Lec 4	Process data. Quality of raw materials and products, guidelines for their storage. Production process course. General scheme of industrial plant.	2
Lec 5	Process equipment, apparatuses of industrial plant. Selection of constructional materials.	2
Lec 6	Control and adjustment of the designed plant. Measurement and control instruments, systems of automatic control.	2
Lec 7	Elaboration of technological-equipment scheme of the industrial plant. Spatial distribution of equipment items and apparatuses.	2
Lec 8	Investment costs and production costs calculation.	1
	Total hours	15
TEACHING TOOLS USED		
N1	Lecture with multimedia presentation.	
EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
<b>Evaluation</b> (F – forming (during semester), P – concluding (at semester end))	Learning outcomes number	Way of evaluating learning outcomes achievement
C (lecture)	PEK_W01 – PEK_W05	Crediting with grade

<b>PRIMARY AND SECONDARY LITERATURE</b>	
<b><u>PRIMARY LITERATURE:</u></b>	
[1]	N. Ghasen, R. Henda, Principles of chemical engineering processes, CRC Press, 2009.
[2]	D.W. Green, R.H. Perry (red.), Perry's chemical engineers' handbook, 8 <sup>th</sup> ed., McGraw-Hill, 2008.
[3]	U. Bröckel, W. Meier, G. Wagner (red.), Product design and engineering. Vol. 1: Basics and technologies, Vol. 2: Raw materials, additives and application, Wiley, 2007.
<b><u>SECONDARY LITERATURE:</u></b>	
[1]	A.C. Dimian, C.S. Bildea, Chemical Process Design. Computer – aided case studies, Wiley, 2008.
[2]	G.H. Vogel, Process Development. From the initial idea to the chemical production plant, Wiley, 2005.
[3]	M. Zlokarnik, Scale-up in chemical engineering, Wiley, 2002.
[4]	G.I. Wells, L.M. Rose, The art of chemical process design, Elsevier, 1986.
[5]	W.D. Seider, Process design principles, J.W.&S., 1999.
<b>SUBJECT SUPERVISOR</b>	
(NAME AND SURNAME, E-MAIL ADDRESS)	
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