

FACULTY OF CHEMISTRY					
SUBJECT CARD					
Name of subject in English:	Technical drawing				
Main field of study (if applicable):	all fields				
Specialization (if applicable):					
Profile:	academic				
Level and form of studies:	1st level, 2nd level – supplementary semester, full-time				
Kind of subject:	obligatory				
Subject code:	GFC011001, GFC024002				
Group of courses:	NO				
	<b>Lecture</b>	<b>Classes</b>	<b>Laboratory</b>	<b>Project</b>	<b>Seminar</b>
Number of hours of organized classes in University (ZZU)			30		
Number of hours of total student workload (CNPS)			60		
Form of crediting			crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points			2		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes			1		
<b>PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES</b>					
1. Basic knowledge of computers					
<b>SUBJECT OBJECTIVES</b>					
C1 Familiarisation with the technical drawing conventions.					
C2 Learning of reading and making a design drawing.					
C3 Working knowledge of using the computer aided design software in making and modifying the technical documentation.					
<b>SUBJECT LEARNING OUTCOMES</b>					
<b>Related to skills:</b>					
PEK_U01 – understands the conventions of technical drawing and the role of standardization on technical drafting.					
PEK_U02 – can project the planar and three-dimensional objects in views.					
PEK_U03 – possesses skills at representation and dimensioning of existing and proposing objects according to technical drawing conventions.					
PEK_U04 – has the sufficient knowledge of reading the design drawings and chemical plant diagrams.					
PEK_U05 – has the working knowledge of using the computer aided design applications in making the technical documentation.					
<b>PROGRAMME CONTENT</b>					
<b>Laboratory</b>				<b>Number of hours</b>	
Proj 1	Organising class. Familiarisation with the safety rules in the computer room. Teaching tools and conditions of course credition. Introduction to CAD			2	

	application – user interface, workspace, drawing area, creating and modifying of objects in AutoCAD.	
Proj 2	Conventions of technical drawing (types of drawing, drawing sizes, scales, title blocks, line styles and types, technical lettering). Settings of parameters in AutoCAD (layer management, setting of attributes, co-ordinate systems).	2
Proj 3	Standardization on technical drawing. Polish Committee for Standardization and it's normalization activity. Searching for standards exercises. Drawing objects in AutoCAD: line, polyline, arc, circle, ellipse, rectangle, polygon.	2
Proj 4	Representation of 2D and 3D objects (axonometric, orthographic and perspective projections). Selection and modifications of objects in AutoCAD: move, copy, rotate, mirror, scale, trim, extend, break, fillet, chamfer, explode, offset.	2
Proj 5	Representation of the internal structural details of object. Sections types: one and more cutting planes, revolved, removed, local, developing. Basic conventions of sections and cuts. Long objects - interrupted views. Symmetrical and revolving objects – representation conventions.	2
Proj 6	Dimensioning on technical drawing (indications, graphic form, rules). Printing of technical documentation in AutoCAD.	2
Proj 7	Repetition and test I.	2
Proj 8	Sectioning of 3D objects. Representation of interpenetrating solids. Curve of interpenetration.	2
Proj 9	Representations and dimensioning of tapers and slopes.	2
Proj 10	Types of joints in engineering constructions. Representation, designation and dimensioning of assembled threaded parts and selected inseparated joints. Simplified representation and dimensioning on technical drawing.	2
Proj 11	Tolerance of dimensions, fitting of elements, deviations of shape, position and surface finish specifications.	2
Proj 12	Design drawing (assembly and production drawings).	2
Proj 13	Diagram drawing. Graphical symbols for diagrams. Chemical equipment representation on diagram. Process flow diagrams for chemical industry.	2
Proj 14	Test II	2
Proj 15	Correction test. Course acceptance.	2
	Total hours	30
<b>TEACHING TOOLS USED</b>		
N1. Multimedia presentations		
N2. Using of AutoCAD software		
<b>EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT</b>		
<b>Evaluation</b> (F – forming (during semester), P – concluding (at semester end))	Learning outcomes number	Way of evaluating learning outcomes achievement
F1	PEK_U01-PEK_U02	test I
F2	PEK_U03-PEK_U05	test II
F3-F8	PEK_U02-PEK_U05	drawings made in AutoCAD
<b><math>P = [(F1+F2)/2 + (F3+F4+...+F8)/6]/2</math></b> 3,0 if $3,00 < P < 3,25$ 3,5 if $3,25 \leq P < 3,75$ 4,0 if $3,75 \leq P < 4,25$ 4,5 if $4,25 \leq P < 4,75$ 5,0 if $4,75 \leq P < 5,00$		

5,5 if $5,00 \leq P$
<b>PRIMARY AND SECONDARY LITERATURE</b>
<b><u>PRIMARY LITERATURE:</u></b> [1] Dobrzański T.: Rysunek techniczny maszynowy, WNT, Warszawa 2017. [2] Pikoń A.: AutoCAD 2018 PL. Pierwsze kroki, Helion, 2018.
<b><u>SECONDARY LITERATURE:</u></b> [1] Burcan J.: Podstawy rysunku technicznego, WNT, 2016. [2] Jaskulski A.: AutoCAD 2018/LT2018/360+ kurs projektowania parametrycznego i nieparametrycznego 2D i 3D: wersja polska i angielska, Wydawnictwo Naukowe PWN, 2017.
<b>SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)</b>
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