

<b>FACULTY OF CHEMISTRY</b>	
<b>SUBJECT CARD</b>	
<b>Name of subject in Polish:</b>	Podstawy grafiki inżynierskiej
<b>Name of subject in English:</b>	Basics of technical drawing
<b>Main field of study (if applicable):</b>	all fields
<b>Specialization (if applicable):</b>	
<b>Profile:</b>	academic
<b>Level and form of studies:</b>	1st level, 2nd level – supplementary semester, full-time
<b>Kind of subject:</b>	obligatory
<b>Subject code:</b>	W03W03-SM2025P
<b>Group of courses:</b>	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)				50	
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 corresponding to classes that require direct participation of lecturers and other academics (BU)				1.4	

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Basic knowledge of computers

**SUBJECT OBJECTIVES**

C1 Familiarisation with the technical drawing conventions.  
 C2 Learning to read and making a design drawing.  
 C3 Working knowledge of using the computer aided design software in making and modifying the technical documentation.

**SUBJECT EDUCATIONAL EFFECTS**

**Related to skills:**

PEU\_U01 – understands the conventions of technical drawing and the role of standardisation on technical drafting.

PEU_U02 – can project the planar and three-dimensional objects in views.
PEU_U03 – possesses skills at representation and dimensioning of existing and proposing objects according to technical drawing conventions.
PEU_U04 – has the sufficient knowledge of reading the design drawings and chemical plant diagrams.
PEU_U05 – has the working knowledge of using computer aided design applications in making the technical documentation.

<b>PROGRAMME CONTENT</b>		
<b>Project</b>		<b>Number of hours</b>
Pr 1	Organising class. Familiarisation with the safety rules in the computer room. Teaching tools and conditions of course completion. Standardisation of technical drawing. Searching for standard exercises.	2
Pr 2	Introduction to CAD application. The user interface, workspace, drawing area, creating and modifying of objects in AutoCAD. Setting the desired AutoCAD operating parameters. Creating a drawing based on the coordinates of points.	2
Pr 3	Introduction to CAD application. Creation and organisation of 2D objects. Drawing objects in AutoCAD: line, polyline, arc, circle, ellipse, rectangle, polygon.	2
Pr 4	Introduction to CAD application. Selection and modifications of objects in AutoCAD: move, copy, rotate, mirror, scale, trim, extend, break, fillet, chamfer, explode, offset.	2
Pr 5	Principles of technical drawing (types of drawings, sheet formats, drawing plates, types and thickness of drawing lines, technical writing). Auto CAD: the creation of inscriptions, managing layers, printing technical documentation.	2
Pr 6-7	Representation of planar and spatial objects in projections (axonometric, orthographic and central projection). Dimensioning the drawings.	4
Pr 8-10	Representation of the interior details of an object. Cross-sections of objects: straight cross-section, half-section, cross-section with several intersecting planes, laying, local cross-section, cross-section and partial view. Dimensioning the drawings.	6
Pr11	Graphical symbols and diagrams in technical drawing. Chemical apparatus. Chemical installation diagrams. Test I	2
Pr12	Dimensioning of threaded joints and selected non-separable joints. Drawing simplifications. Dimensioning the drawings continued.	2
Pr13	Principles of preparing working and assembly drawings. Dimensional tolerances and fits of structural components, deviations in shape and position. Determination of the geometrical structure of surfaces.	2
Pr14	Graphical representation of intersecting objects. Sections of solids by planes and lines.	2
Pr15	Test II. Course acceptance.	2
Total hours		30

<b>TEACHING TOOLS USED</b>
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N1. Multimedia presentations  
N2. Using of AutoCAD software

### EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
F1	PEU_U01-PEU_U02	test I
F2	PEU_U03-PEU_U05	test II
F3-F8	PEU_U02-PEU_U05	drawings made in AutoCAD
$P = [(F1+F2)/2 + (F3+F4+\dots+F8)/6] / 2$ <p>3,0 if <math>3,00 \leq P &lt; 3,25</math>            3,5 if <math>3,25 \leq P &lt; 3,75</math>            4,0 if <math>3,75 \leq P &lt; 4,25</math>            4,5 if <math>4,25 \leq P &lt; 4,75</math>            5,0 if <math>4,75 \leq P &lt; 5,25</math>            5,5 if <math>5,25 \leq P</math></p>		

### PRIMARY AND SECONDARY LITERATURE

#### **PRIMARY LITERATURE:**

- [1] B.Bielefeld, I.Skiba, Basics Technical Drawing, Birkhäuser 2013.  
 [2] K.Rathnam, A First Course in Engineering Drawing, Springer Singapore Pte. Limited 2017  
 [3] J.Leach, S.Lockhart, AutoCAD 2022 Instructor: A Student Guide for In-depth Coverage of Autocad's Commands and Features, SDC Publications, 2021

#### **SECONDARY LITERATURE:**

- [1] C.Simmons, N.Phelps, Manual of Engineering Drawing: Technical Product Specification and Documentation to British and International Standards, Oxford: Elsevier Science & Technology 2012.  
 [2] A.Congdon-Fuller, A.Ramirez, D.Smith, Technical Drawing 101 with AutoCAD 2022, SDC Publications, 2021.  
 [3] A.Bhatt, AutoCAD 2022 Beginners Guide, CADFolks 2021.

#### **SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)**

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