



Subject card

Subject name and code	ENGINEER GRAPHICS, PG_00064370						
Field of study	Chemistry						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Robert Aranowski					
	Teachers	dr inż. Robert Aranowski dr inż. Szymon Dudziak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study		SUM
	Number of study hours	45	5.0		30.0		80
Subject objectives	The aim of the course is to provide the student with knowledge of the basics of descriptive geometry and construction notation (technical drawing) and the ability to use the indicated CAD program to create technical documentation of an example device on the project. The knowledge and skills obtained should enable reading and creating technical drawings and technological diagrams.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_K03] is aware of the importance of caring for the quality and diligence of the tasks performed, being responsible for their consequences	has the knowledge and skills necessary to complete the assigned design task on time			[SK2] Assessment of progress of work		
	[K6_U04] creates detailed documentation of the results obtained from the experiments carried out individually or as part of a team, analysing and interpreting the results in the form of text documents, spreadsheets, graphs, technological diagrams, multimedia presentations using correct chemical nomenclature	is able to prepare technical documentation for a designed element of a technological installation.			[SU1] Assessment of task fulfilment		
	[K6_W05] recognises methods, techniques and tools of computer aided design for solving engineering tasks in chemistry, chemical engineering and technology, mechanical engineering, in the design and analysis of technological processes	has the knowledge necessary to carry out the assigned project activities			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U06] analyses the operation of equipment, apparatus and process lines used in laboratories and the chemical industry	Student has the knowledge and skills necessary to design chemical industry devices that are safe for humans and the environment.			[SU1] Assessment of task fulfilment		

Subject contents	<p>Lecture:</p> <p>Graphical representation of spatial elements on a plane: projection as a basic form of spatial representation on a plane, spatial representations in rectangular projections, associated and parallel elements in rectangular projection, perpendicularity of lines and planes. Sections and penetration of flat and spatial objects: construction of spatial solids standing on projections, common elements, sections of polyhedrons by projection planes, sections and penetration of polyhedrons. Representations of surfaces of revolution in rectangular projections: projections of points lying on surfaces of revolution solids, sections of revolution solids by projection planes. Notation of structures: basic concepts, principles of notation of structures, types of notation of structures, sheet formats and drawing scales, methods of graphic representation of the notation of the structural form and the system of dimensions. Graphical notation of construction connections: detachable connections, inseparable connections. Assembly and execution drawings. Computer recording of construction: computer methods of graphical representation, graphical CAD computer program, Selected graphic symbols used in chemistry and chemical technology. Selected geometric structures.</p> <p>Project:</p> <p>Using Inventor 2021 or newer software to create design documentation: user interface basics, creating your own templates, drawing template, part model template, assembly model template; Viewing objects; Introduction to part design: parametric; Part modeling; Editing documentation; Modifying the design from the model or drawing level; Parametric 2D modeling, sketches and sketch planes, parametric sketch planes, defining the sketch plane; Parametric 2D modeling operations; Creating 3D elements: Extrude; Revolve; Angle rotation; Changing the order of modeling operations; Sweep; Lofting surfaces; Ribs; Inserted elements; Holes: types and types of holes, methods for determining the position of holes; Thread and hole definition files; Editing and writing 2D part documentation; Documentation file types, drawing file creation; Drawing templates; Drawing constants; Sheet layout editing; I-properties editing; Object style; Main and dependent styles; Layers; Text style; Dimension style; Style management; Exporting and importing standard elements; Basics of creating views; Creating a base model view; Creating basic derived views, Creating a section and detail.</p>											
Prerequisites and co-requisites	<p>Basics computer skills on MS Windows operating system, ability to use pointing tools (mouse, tablet). Knowledge of the MS Windows file and directory system and the ability to perform operations on them (copying, deleting, searching, creating folders). Ability to use FTP, HTTP and file compression software.</p>											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 860 794 887">Subject passing criteria</th> <th data-bbox="799 860 1137 887">Passing threshold</th> <th data-bbox="1142 860 1481 887">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 893 794 920">Project</td> <td data-bbox="799 893 1137 920">60.0%</td> <td data-bbox="1142 893 1481 920">60.0%</td> </tr> <tr> <td data-bbox="456 927 794 954">Written exam</td> <td data-bbox="799 927 1137 954">60.0%</td> <td data-bbox="1142 927 1481 954">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	60.0%	60.0%	Written exam	60.0%	40.0%
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<p>Example issues/ example questions/ tasks being completed</p>	<p>Sample questions. tasks - lecture:</p> <ol style="list-style-type: none"> 1.What is the purpose of a very thick continuous line in a technical drawing? 2.What is the purpose of a thin line in a technical drawing? 3.Give an example of marking surface convergence 4.Give an example of marking the development length 5.Explain the terms: diagram, sketch, technical drawing 6.Explain the concepts: part drawing, detail drawing, outline drawing, executive drawing 7.Enter the size of the A4 and A1/2 sheet in mm 8.Give an example of marking the development length 9. How do we define the average surface roughness deviation Ra? 10.Draw an Archimedes spiral with pitch h. Describe the individual activities <p>Example tasks - project:</p> <ol style="list-style-type: none"> 1. Design the parts using Inventor based on the technical documentation below 2. Assemble the parts according to the technical documentation below 3. Make connections with welded parts 4. Make technical drawings of parts and assemblies of objects 5.Determine the physical parameters such as mass, volume, center of gravity of the part
<p>Work placement</p>	<p>Not applicable</p>

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