GDAŃSK UNIVERSITY OF TECHNOLOGY

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	**Lecture:** 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. **Project:** 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.
Prerequisites and co-requisites	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.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	60.0%	60.0%
Written exam	60.0%	40.0%

Recommended reading

Basic literature	1. Koczyk H.: Geometria wykreślna. PWN, Warszawa 1995. 2. Dobrzański T.: Rysunek techniczny maszynowy. WNT Warszawa 2005. 3. Jaskulski A., Autodesk Inventor Professional 2021 PL / 2021+ / Fusion 360. Metodyka projektowania, Helion 2020, ISBN 978-83-283-7310-5 4. Suseł M., Makowski K., Grafika inżynierska z zastosowaniem programu AutoCAD, ISBN: 83-7085-910-0, Oficyna Wydawnicza Politechniki Wrocławskiej. 5. Mazur J., Kosiński K., Polakowski K., Grafika inżynierska z wykorzystaniem metod CAD, Wydawnictwo: Oficyna Wydawnicza Politechniki Warszawskiej, Rok wydania: 2004, ISBN: 8372074631. 6. Droździel P., Krzywonos L., Kudasiewicz Z. ,Zniszczyński A.: Grafika Inżynierska. Zbiór zadań dla mechaników. Cz 1. Liber Duo, Lublin 2005.
Supplementary literature	1. PN-EN ISO 128-24: 2003. Rysunek techniczny. Zasady ogólne przedstawiania. Część 2 Linie na rysunkach technicznych maszynowych. 2. PN-EN ISO 3098-0: 2002. Dokumentacja techniczna wyrobu. Pismo. Część 0. Zasady ogólne. 3. PN-EN ISO 3092-2: 2002. Dokumentacja techniczna wyrobu. Pismo. Część 2. Alfabet łaciński, cyfry i znaki. 4. PN-EN ISO 5456-1: 2002. Rysunek techniczny. Metody rzutowania. Część 1. Postanowienia ogólne. 5. PN-EN ISO 5456-2: 2002. Rysunek techniczny. Metody rzutowania. Część 2. Przedstawianie prostokątne. 6. PN-EN ISO 5456-3: 2002. Rysunek techniczny. Metody rzutowania. Część 3. Przedstawianie aksonometryczne.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Sample questions. tasks - lecture: 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 Example tasks - project: 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
Work placement	Not applicable

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