GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ENGINEER GRAPHICS, PG_00037350		
Field of study	Chemistry		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Robert Aranowski	
	Teachers	dr inż. Iwona Cichowska-Kopczyńska dr inż. Robert Aranowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	15.0	30

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

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	30	5.0	15.0	50

Subject objectives

The aim of the subject is drawing geometry and methods of presenting machinery construction. The Students should master in selected CAD software presented on exercises. Obtained knowledge should allowed mainly reading technical and flaw sheeting drawings.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U06] can analyze the functioning of equipment, apparatus and technology lines used in laboratories and chemical industry, and can recognize and propose methods to solve the simple engineering tasks which he can meet as an Engineer and select and use routine methods, chemical apparatus and tools to solve practical engineering tasks, including also technological processes; can himself/herself read and make technical drawings using CAD software	Student making project drawings has knowledge and skills essential for design chemical equipment safe for human and environment.	[SU1] Assessment of task fulfilment
[K6_U02] can work individually and in a team; he/she can assess the necessary task time and plan and organize individual work and in a small team in a way that ensures the execution of the task within a set deadline	Student can schedule of drawing a engineering graphs taking into consideration potential and ability of members group.	[SU1] Assessment of task fulfilment
[K6_U04] can use professional vocabulary, can prepare and communicate technical information in the form of text documents, spreadsheets, charts and technological schema	Student is able to design a part of chemical equipment according to given parameters.	[SU4] Assessment of ability to use methods and tools

Subject contents	**Lecture:** The graphic representation of three-dimensional objects in two dimensions, the projection as basic form of spatial imitations on a plane, spatial imitations in rectangular view, the belonging elements and parallel in projection on rectangular, the perpendicularity straight and the planes. Cut and intersection of flat 3D objects: the build of spatial soilds standing on projective planes. The imitation surfaces of rotatory solids in rectangular view: the views of points lying on surfaces of rotatory solids, the cut of rotatory solids by projections planes. The construction drawing: the basic notions, principle of construction drawing, types of construction drawings, formats of sheets and the drawing scales, method of construction notation and lay-out of dimensions. The graphic notation of constructional connections: temporary fastening, permanent fastening. Assembly drawing and working drawings. The digital notation of construction: the computer methods of graphic imaging, computer added design programs (CAD). Selected graphic symbols used in chemistry and chemical technology. **Seminar:** Inventor 2021, creating your own templates, ISO-PL idw drawing template, Part model template, assembly model template; Introduction to user interface, activating an existing project, toolbars and tools, objects views; Introduction to parts design: parametric, mathematical model of the solids, geometric model of the solids, parameters and decision variables, 3D objects, 3D objects in 2D modeling; Concepts related to derivative model technique, typical part design process, part modeling; Editing of documentation; Modification of the design from the level of a model or drawing; 2D parametric modeling, sketches and sketch planes, parametric sketch planes, define sketch planes; Parametric 2D modeling operations; Modeling methods, standard modeling tools and techniques, elements of classic dialog boxes, elements of new type dialog boxes; Tool work process (Workflow); Input geometry; Modeling operation parameters; Modeling method; Advanced properties; Profile definition algorithm; Sketch sharing; Sharing of construction elements; Extruding with a profile (Extrude); Base element; Other pull-out elements; To Next Extrude; To (To) Extrude; Between Extrude; Through draw; Profile rotation (Revolve); Rotation by angle (Angle); To Next; Full rotation; Reorder modeling operations; Sweep; Unbending surfaces (Loft); Ribs (Rib); Inline elements; Holes: types and types of holes, methods of determining the location of holes; Thread and hole definition files; Hole definition algorithm: Concentric method, Linear method, From Sketch method; Editing and editing of 2D part documentation; drawing file types, preliminary steps; creating a drawing file; drawing application options; document settings; drawing templates; fixed drawing elements edition of the sheet layout; i-properties editing; style of objects in the drawing file - drawing standard; general standard settings; standard styles available; default values of objects; main and dependent styles; layers; text style; dimension style; management of standard elements (styles); additional interface elements; creating a new style as standard - exercises; export and import of standard elements - exercises; basics of creating projections; creating a base view of the model; creating basic linked views.
Prerequisites and co-requisites	Basic level knowledge of computer operation, MS Windows operating system, handling skill of pointing devices (e.g.: mouse, digitizing tablet).

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical exercise	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. Pikoń J., AutoCAD 2002, Helion, Warszawa 2002. 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	

Example issues/ example questions/ tasks being completed	**Sample questions - lecture:** 1. What is the purpose of a continuous very thick line in a technical drawing? 2. What is the purpose of the dashed line in technical drawing? 3. Give an example of marking the convergence of surfaces 4. Give an example of marking the unfolding length 5. Explain the concepts: diagram, sketch, technical drawing 6. Explain the concepts: part, detail, stroke, manufacturing drawing 7. Enter the size of A4 and A1 / 2 sheets in mm 8. Give an example of marking the unfolding length 9. How do we define the mean surface roughness deviation Ra? 10. Draw the Archimedes spiral with pitch h. Describe the individual steps Sample exercises - seminar: 1. Construct parts with Inventor based on the technical documentation presented below 2. Assemble the parts according to the following technical documentation 3. Make assemby welded parts 4. Make technical drawings of parts and assemblies of objects 5. Define physical parameters such as mass, volume, center of gravity of the part
Work placement	Not applicable