



Subject card

Subject name and code	Computer graphics, PG_00069007						
Field of study	Cosmetic technologies						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Robert Aranowski				
	Teachers		dr inż. Robert Aranowski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	40.0	0.0	0.0	55
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 6825 Grafika komputerowa, Technologie Kosmetyczne, 2026-27-01 https://enauczanie.pg.edu.pl/2025/course/view.php?id=6825						
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	55		5.0		40.0	100
Subject objectives	The aim of the course is to introduce students to the fundamentals of engineering graphics and the principles of technical documentation and to develop practical skills in using computer-aided design systems. Students learn the fundamental principles of technical drawing, particularly the representation of three-dimensional objects, orthographic projection, sectional views, dimensioning, and the use of graphical symbols and conventions. They develop skills in creating and editing 2D CAD documentation, building simple parametric 3D models and generating technical drawings from these models. The course also covers the preparation of technical diagrams, graphical presentation of data and integration of graphical information into coherent engineering documentation using modern computer tools. The course develops the ability to correctly use digital technical documentation and awareness of intellectual property protection principles.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U01] designs experiments in accordance with the state of knowledge and the latest scientific literature, using computer data analysis methods		is able to use computer tools to process data and prepare coherent technical documentation containing drawings, models, diagrams, tables and charts.		[SU1] Assessment of task fulfilment		
	[K6_W07] has knowledge of designing experiments while maintaining intellectual property protection and the principles of bioethics and applicable legal regulations		knows the principles of preparing and using technical documentation and the principles of intellectual property protection related to the creation, use and modification of digital graphical materials and documentation.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W04] selects data analysis methods, including statistical, modeling and artificial intelligence, useful for solving technological and scientific problems in the field of cosmetic technology and related fields		knows the principles of technical drawing and computer-aided methods for preparing technical documentation, modelling objects and presenting data graphically.		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Course content – lecture Fundamental concepts of engineering graphics and the importance of graphical documentation in engineering practice. Technical drawing as a means of unambiguous communication of information concerning the shape, dimensions, construction and properties of technical objects. Basic technical drawing standards. Drawing sheet formats, title blocks, scales, line types and weights, technical lettering, and basic symbols used in technical documentation. Fundamentals of descriptive geometry applied to technical drawing. Principles of representing three-dimensional objects on a two-dimensional plane. Orthographic projection, arrangement and selection of views, and principles of representing objects. Representation of internal features of objects. Sectional views and sections, their types, principles of creation and designation, and hatching of sectioned surfaces. Simplified and conventional representations of components in technical drawings. Principles of dimensioning technical drawings. Elements and arrangement of dimensions, and dimensioning of diameters, radii, angles and repeated features. Principles for selecting dimensions required to define object geometry unambiguously. Introduction to dimensional tolerances, fits and surface texture designation. Fundamentals of mechanical drawing and technical component documentation. Conventional representation of basic machine elements, components and connections. Reading simple detail and assembly drawings and identifying technical information contained in engineering documentation. Fundamentals of parametric 3D modelling. Sketches, geometric and dimensional constraints, and basic solid modelling operations. Relationship between a 3D model and 2D documentation. Automatic generation of views, sections and dimensions from 3D models. Fundamentals of technical and process diagrams and graphical representation of process flows. Principles of clear arrangement of elements and appropriate use of symbols, connections and annotations. Course content – laboratory Practical introduction to workflow organization in a CAD environment and the preparation of computer-aided technical drawings. Configuration of the working environment, use of coordinate systems, and precise geometry input. Creation and modification of basic geometric objects. Use of layers, object properties, line types and line weights, text styles, and blocks to organize drawing documentation. Creation of basic geometric constructions and technical drawings using AutoCAD. Preparation of orthographic projections, views, and sectional views. Application of hatching and graphical conventions in accordance with technical drawing standards. Dimensioning of drawings, creation and application of dimension styles, and preparation of technical documentation for printing at the appropriate scale and sheet format. Creation of simple technical and process diagrams using layers, blocks, symbols, connections, and annotations. Preparation of clear graphical documentation representing the structure of equipment, a workstation, or the sequence of operations in a simple technological process. Practical introduction to parametric 3D modelling using Autodesk Inventor. Creation of 2D sketches, application of geometric and dimensional constraints, and verification of sketch constraint status. Creation of solid models using basic modelling operations such as extrusion, revolution, holes, chamfers, fillets, and patterns. Modelling of simple parts and technical objects and modification of their geometry by changing model parameters. Creation of simple assemblies and definition of basic relationships between their components. Generation of technical drawings from 3D models. Automatic creation of drawing views, sectional views, and detail views, addition of dimensions and annotations, and preparation of technical drawing sheets.
Prerequisites and co-requisites	Basic computer literacy and the ability to use common office applications are required. Students should have fundamental knowledge of mathematics and geometry and be able to interpret simple charts and numerical data.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture test – fundamentals of engineering graphics and technical drawing	50.0%	30.0%
	Integrative assignment – technical documentation (Laboratory)	50.0%	15.0%
	Test on the fundamentals of engineering graphics and technical drawing (Lecture)	50.0%	25.0%
	AutoCAD assignment (Laboratory)	50.0%	30.0%
Recommended reading	Basic literature	1. Dobrzański, T., <i>Rysunek techniczny maszynowy [Mechanical Technical Drawing]</i> , 27th ed., Wydawnictwo Naukowe PWN, Warsaw, 2025, ISBN 978-83-01-24308-1. 2. Pikoń, A., <i>AutoCAD 2026 PL. Pierwsze kroki [AutoCAD 2026 PL. First Steps]</i> , Helion, Gliwice, 2025, ISBN 978-83-289-3083-4. 3. Jaskulski, A., <i>Autodesk Inventor Professional 2024 PL / 2024+ / Fusion 360. Metodyka efektywnego projektowania [Autodesk Inventor Professional 2024 PL / 2024+ / Fusion 360. Effective Design Methodology]</i> , Helion, Gliwice, 2023, ISBN 978-83-289-0011-0.	
	Supplementary literature	1. Polish PN-EN ISO Standards concerning technical product documentation and technical drawing , in particular standards relating to representation principles, line conventions, projection, dimensioning, tolerancing, and surface texture indication – within the scope specified by the course instructor. 2. Autodesk, <i>AutoCAD Help</i> , electronic documentation for AutoCAD, available online. 3. Autodesk, <i>Inventor Help</i> , electronic documentation for Autodesk Inventor, available online.	
	eResources addresses	Supplementary https://help.autodesk.com/view/ACD/2026/ENU/?utm_source=chatgpt.com - Autodesk, AutoCAD electronic documentation, online access. https://help.autodesk.com/view/INVTOR/2026/ENU/?utm_source=chatgpt.com - Autodesk, Inventor electronic documentation, online access.	
Example issues/ example questions/ tasks being completed	Preparation of “Computer-Aided Technical Documentation of a Simple Device or Component Used in Cosmetic Technology.” The student is provided with a simple object or a set of design assumptions and prepares: • a parametric 3D model of the selected component in Inventor, • a properly prepared detail drawing including views, a sectional view and dimensions, • if required, a simple assembly consisting of several components, • a diagram showing the application of the component within a device or process, • a table of basic technical parameters, • a simple chart based on the provided data, • brief and coherent final technical documentation.		
Practical activities within the subject	Not applicable		

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