GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Engineer Graphics, PG_00058225		
Field of study	Biotechnology		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	second-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	Department of Energy Conversion and Storage -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Ryms	
	Teachers	dr inż. Michał Ryms	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

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	30	4.0	16.0	50

Subject objectives

Mastering the use of technical drawing as a tool in the engineer's work.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U10] is able to use knowledge about possibilities, aims and limitations of biotechnology to develop, design and obtain products and biotechnological processes in the area of his/her specialization	can work individually and in a team, can estimate the time needed to complete a task, can develop and implement a work schedule that ensures meeting deadlines.	[SU1] Assessment of task fulfilment
[K7_W10] has knowledge in the field of bioprocess technology and engineering and knowledge in the field of engineering design of technical objects and processes including engineering graphics with the use of computer-aided design and databases	is able recreate spatial elements on a drawing plane, using orthogonal and axonometric, as well as cross-section projections. Is familiar with basic dimensioning guidelines and how to prepare technical drawings (working and assembly drawings). Is able to use computer-aided 2D and 3D design software at a basic level, allowing to prepare simple technical documentation. Student can also create simple construction diagrams with the help of such programs.	[SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>Program Content:
Over the course of lectures, student familiarizes himself with methods of spatial element recreation in a the drawing plane, theory of engineering design recording and methods of computer-aided systems designing. The
scope of program includes, in particular:
- Introduction to the subject (formats, lines, scales, technical writing),
- Methods of imaging three-dimensional objects on a drawing plane (object projections, finding the missing projection and isometric projections, cross-sections, revolved sections with dimensioning guidelines),
- Working and assembly drawings preparation,
- Disjoint connection drawings (screw joints, pipe threaded connections, bolts, fittings and elbows, thread protections against dismantling),
- Drawings of permanent joints (welded, soldered and riveted joints),
- Drawings of selected elements from heating and plumbing installation and armature (with emphasis on tanks,
piping, valves, sight glasses, liquid level gauges and measuring points different examples from construction industry).
- Full installations projects (drawings).
The course provides a gradual and fluent transition from drawing on paper to drawing in the CAD (Computer Aided Design) environment, in particular, with use of Autodesk AutoCAD software.</td></tr>
<tr><td>Prerequisites
and co-requisites</td><td></td></tr>
<tr><td>Assessment methods
and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exam</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>30.0%</td></tr>
<tr><td>Midterm colloquium</td><td>60.0%</td><td>50.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. T. Dobrzański, Rysunek techniczny maszynowy, Wyd. WNT 2013,
2. W.M. Lewandowski, Maszynoznawstwo chemiczne, Gdańsk 1998,
3. M. Kochanowski, Zapis konstrukcji z geometrią wykreślną, Wyd. PG 2002,
4. K. Paprocki, Zasady zapisu konstrukcji, OWPW, Warszawa 2000,
5. A. Pikoń, AutoCAD 2011 PL - Pierwsze kroki, Wyd. Helion 2011
6. M. Rogulski, Autocad dla studentów, Wyd. Witkom, 2011</td></tr>
<tr><td>Supplementary literature</td><td>websites materials, programs instructions</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
GRAFIKA INŻYNIERSKA - 2022 - Moodle ID: 22519
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22519</td></tr>
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<tr><td>Example issues/
example questions/
tasks being completed</td><td>- Introduction to the subject (formats, lines, scales, technical writing),
- Methods of imaging three-dimensional objects on a drawing plane (object projections, finding the missing projection and isometric projections, cross-sections, revolved sections with dimensioning guidelines),
- Working and assembly drawings preparation,
- Disjoint connection drawings (screw joints, pipe threaded connections, bolts, fittings and elbows, thread protections against dismantling),
- Drawings of permanent joints (welded, soldered and riveted joints),
- Drawings of selected elements from heating and plumbing installation.
- Designing of valves (drawings). Drawing fittings elements of chemical installations with
special attention to tanks, piping, valves, sight glasses, liquid level gauges and measuring connectors.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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