GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Equipment and machinery in the polymer industry, PG_00061928		
Field of study	Aparatura i maszyny w przemyśle tworzyw sztucznych		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Polymer Technology -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Janusz Datta	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	15.0	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	50.0	100

Subject objectives

Teaching students the main elements of construction and the operation and proper use of selected machines and apparatus of the plastics industry

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] Knows selected aspects of construction and operation of scientific equipment in materials engineering.	knows the basics of various work scientific apparatus used in materials engineering	[SW1] Ocena wiedzy faktograficznej
[K6_U09] Has the ability to prepare oral presentations in Polish and in a foreign language, concerning detailed issues, using fundamental theoretical approaches, and diverse sources.	is able to prepare an oral presentation on a given topic in Polish and in English, using the basic theoretical concepts	[SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania
[K6_U06] Can integrate obtained information, interpret it and draw conclusions, as well as formulate and justify opinions.	The student is able to analyze the obtained results; interpret them and present conclusions	[SU2] Ocena umiejętności analizy informacji
[K6_W06] Knows selected methods, techniques, tools and materials used in solving simple engineering problems within the scope of materials engineering.	knows the basic methods of activities that are applied during solving engineering problems	[SW2] Ocena wiedzy zawartej w prezentacji
[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.	is aware of its own limitations in owned knowledge; is able to address your doubts to specialists; understand the need continuous improvement of competences	[SK2] Ocena postępów pracy

<table>
<tr><td>Subject contents</td><td>Apparatus for the production of polymeric materials - containers, chemical reactors. Apparatus for the pre-treatment of polymer materials - stationary, mobile, stand-alone and multi-station dryers with a dry air aggregate; mills; mixers; granulators. Cutting machines. Injection molding machines - standard injection molding machines, injection molds. Extruders, extrusion heads, calibrators, cooling baths, granulators. Modern twin screw extruders, cylindrical snails, segmented screws. Apparatus and machines for producing rubber - Mixers, rolling mills, calenders, hydraulic presses, injection molding machines for rubber products, Dosing and mixing aggregates in RIM and RRIM technology, gear and membrane pumps, mixing heads, two-part and multi-section systems. Recycling machines</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge of polymer synthesis methods; knowledge of the criteria for assessing the quality of plastics and basic testing methods for plastics</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>written</td><td>50.0%</td><td>60.0%</td></tr>
<tr><td>prezentation</td><td>90.0%</td><td>40.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1) Sikora R., Przetwórstwo Tworzyw polimerowych. Podstawy logiczne, formalne i terminologiczne. Wydawnictwo Politechniki Lubelskiej, Lublin 2008.
2)Poradnik konstruktora maszyn, Verlag Dashofer , Warszwa 2008
3)White R., De S.K., Poradnik technologa gumy, przekład i wydanie IPGum "Stomil" Piastów 2003</td></tr>
<tr><td>Supplementary literature</td><td>Katalog maszyn i urządzeń do utylizacji odpadów, KBN, Katowice 1996</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Indicate the control and measurement equipment used in chemical reactors, e.g., for the synthesis of polyurethane polyols.

2. Describe the devices used to remove moisture from polymer granules or recyclate.

3. How does the dosing and mixing unit work and how are the tanks filled with reagents?</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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