



## Subject card

Subject name and code	Equipment and machinery in the polymer industry, PG_00060352						
Field of study	Aparatura i maszyny w przemyśle tworzyw sztucznych						
Date of commencement of studies	October 2024		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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		exam		
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	15.0	0.0	0.0	0.0	15.0	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		5.0		40.0	75
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_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.		The student has the ability to prepare oral presentations on technical issues and is able to use appropriate technical language.		[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu		
	[K6_W04] Knows selected aspects of construction and operation of scientific equipment in materials engineering.		The student knows the basic aspects related to the construction and operation of equipment in the field of materials engineering.		[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym		
	[K6_W06] Knows selected methods, techniques, tools and materials used in solving simple engineering problems within the scope of materials engineering.		The student knows the techniques, tools, and materials used in solving simple engineering tasks.		[SW1] Ocena wiedzy faktograficznej		
Subject contents	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						
Prerequisites and co-requisites	Knowledge of polymer synthesis methods; knowledge of the criteria for assessing the quality of plastics and basic testing methods for plastics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	written		50.0%		60.0%		
	prezentation		90.0%		40.0%		

Recommended reading	Basic literature	1) Sikora R., Przetwórstwo Tworzyw polimerowych. Podstawy logiczne, formalne i terminologiczne. Wydawnictwo Politechniki Lubelskiej, Lublin 2008. 2) Poradnik konstruktora maszyn, Verlag Dashofer, Warszawa 2008 3) White R., De S.K., Poradnik technologa gumy, przekład i wydanie IPGum "Stomil" Piastów 2003
	Supplementary literature	Katalog maszyn i urządzeń do utylizacji odpadów, KBN, Katowice 1996
	eResources addresses	
Example issues/ example questions/ tasks being completed	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 recycle.  3. How does the dosing and mixing unit work and how are the tanks filled with reagents?	
Practical activities within the subject	Not applicable	

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